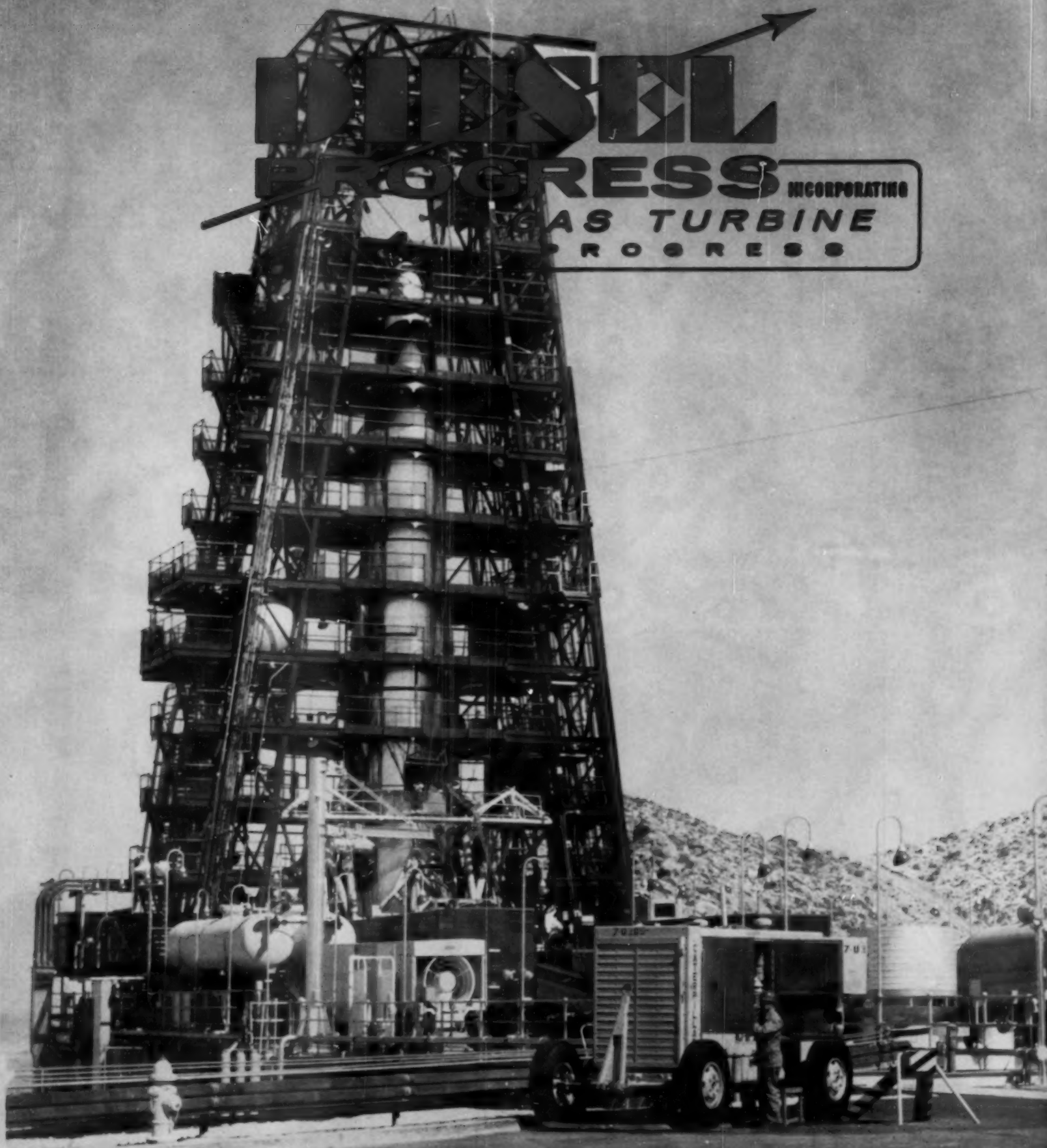


IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

DIESEL PROGRESS

INCORPORATING
GAS TURBINE
PROGRESS

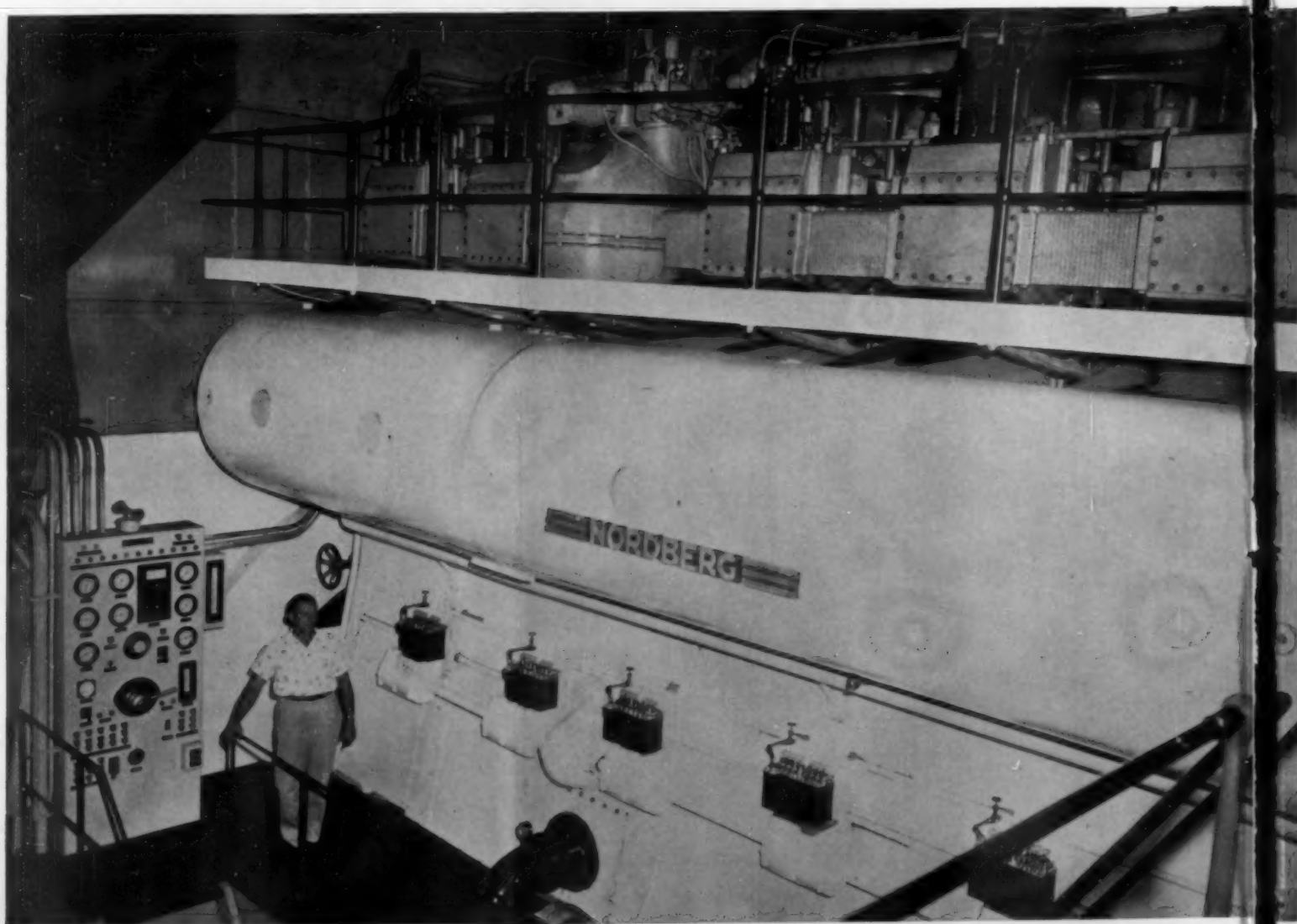


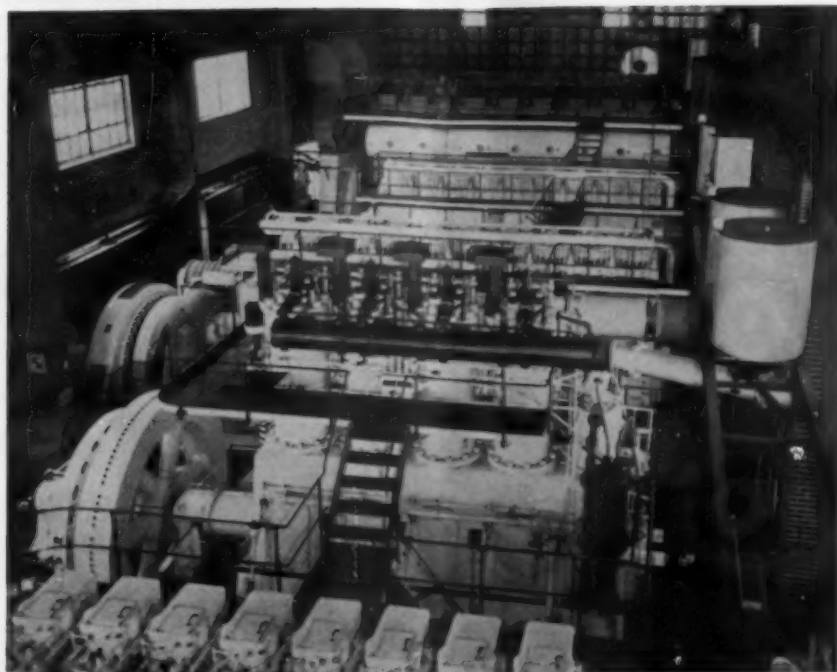
FIVE DOLLARS PER YEAR

NOVEMBER, 1958

FIFTY CENTS PER COPY

8,000 Hours Without Shutdown...





THANKS TO TEXACO LUBRICATION

*"I've never seen a cleaner engine. Wear is negligible."—reports
Fred Gossett, Superintendent of Vero Beach, Florida, power plant*

"We recently shut down our 10-cylinder Nordberg diesel engine for inspection after 8,000 hours of operation," says Mr. Gossett. "Like the other five engines we've put on Texaco Ursa Oils, this one was outstandingly clean, free from deposits and wear, and had been a real miser with fuel."

This performance record, which was expected on the basis of previous experience with Ursa Oils, is one reason why the entire Vero Beach power plant is 100% Texaco lubricated.

It's also one good reason why:

For over 20 years, more stationary diesel h.p. in the U. S. has been lubricated with Texaco than with any other brand.

You see, Texaco Ursa Oils are especially refined to give you *more power with less fuel over longer periods* between overhauls, in all

diesel, gas and dual-fuel engines. Your Texaco Lubrication Engineer will gladly help you select the oil best suited to your engines.

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street,
New York 17, N. Y.



LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

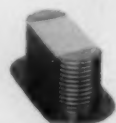
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

From General Motors...Temperatures made to order!



**HARRISON-COOLED GM DIESELS UNLOAD
HUGE 25,000-BARREL OIL BARGES!**

Pumping out this payload takes power and speed . . . and Harrison keeps the job flowing. Harrison-cooled GM Diesels keep pumps running with no downtime for heat problems. Rugged and reliable, Harrison heat exchangers keep an accurate check on vital engine temperatures. And every Harrison heat exchanger is backed by over 48 years' experience in the manufacture of top-quality heat control products. That's why you'll find Harrison on so many major jobs in industry and defense. If you have a cooling problem, look to Harrison for the answer.



Harrison Heat Exchangers
—Top-Quality Products
of General Motors Research and Engineering.



HARRISON RADIATOR DIVISION OF GENERAL MOTORS, LOCKPORT, NEW YORK

DIESEL and GAS TURBINE PROGRESS

REX W. WADMAN *Editor and Publisher*

MEMBER OF



Business Publications Audit
of Circulation, Inc.

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

BRUCE W. WADMAN *Executive Vice Pres.*
ROBERT E. SCHULZ *Managing Editor*
JAMES W. BROWN *Midwest Editor*
F. HAL HIGGINS *Western Field Editor*
DONALD M. TAYLOR *Southwest Editor*
PEGGY R. TOMACK *Production Manager*

MEMBER OF

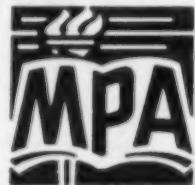


Verified Audit Circulation
Company

DIESEL PROGRESS for November, 1958, Vol. XXIV, No. 11. Published Monthly by Diesel Engines, Inc., 1701 W. Wisconsin Ave., Milwaukee 3, Wisc. Phone Division 4-5335. Subscription rates are \$5.00 for U.S.A. and possessions. All other countries \$7.50 per year. Subscriptions may be paid the London Office at £2-12s-6d per year. Accepted as Controlled Circulation Publication at Long Prairie, Minnesota.

DIESEL PROGRESS is indexed regularly by Engineering Index, Inc. and is available in microfilm editions from University Microfilms, Inc., Ann Arbor, Michigan.

MEMBER OF



Magazine Publishers
Association, Inc.

CONTENTS FOR NOVEMBER, 1958

Mighty Oahe Dam Moves Ahead	27
Morgan City, Louisiana	30
Locomotive Upgrading Pays Dividends	32
Developments In Outboard Propulsion	34
Hercules To Market Jlo-Werke Diesels	37
Drilling Record Set In Oklahoma	38
Diesel Equipment Helps Set New Paving Record	40
Machinery Dealers Meet Military Power Demands	42
Diesel Fleet Key To Efficient Service	45
Carthage, Missouri	48
1280 HP Tug <i>Hustler II</i>	50
Dieselized Chipper Clears Right-Of-Way	52
Diesel Safeguards Mercy Hospital	53
First Aluminum Tug <i>M/V Sumter</i>	53
What's Going On In England	54
Sea-Going <i>Barge 539</i> Enters Coastal Service	55
Gas Turbine Progress	56
Burmeister & Wain Builds 15,000 HP Marine Diesel	57
Diesel Service Progress	58

EXECUTIVE OFFICES

816 N. La Cienega Blvd.
Los Angeles 46, Calif.

EDITORIAL OFFICES

1701 W. Wisconsin Ave.
Milwaukee 3, Wisc.

BUSINESS OFFICES

MILWAUKEE 3:
Bruce W. Wadman
1701 W. Wisconsin Ave.
Division 4-5335

LONDON E.C. 4:
G. L. Fetherstonhaugh
St. Paul's Corner
Ludgate Hill

NEW YORK 17:
Jack Bain Company
545 Fifth Ave.
Murray Hill 2-3345

FIELD EDITORS

MIAMI, FLA.:
Edwin Dennis
250 W. 50th St.
TUxedo 8-2188

LOS ANGELES 46:
James Joseph
8421 Melrose Ave.
OLive 3-4542

HOUSTON 18, TEXAS
Donald M. Taylor
1345 Chamberland Lane
OVerland 6-1127

PORT LAVACA, TEXAS:
Ruel McDaniel
P. O. Drawer 45

JEFFERSON CITY, MO.:
L. H. Houck
400 Linden Dr.
Phone: 6-2993

NORTHWOOD, MIDDX, ENGLAND:
B. W. Lansdowne
"Oaklands," Nicholas Way

DETROIT 39, MICH.:
James W. Brown
15936 Kinloch Road
KEnwood 2-1545

EVANSVILLE, IND.:
A. D. Burroughs
605 W. Maryland St.
HARRISON 3-7313

FRONT COVER ILLUSTRATION

Atlas missile set up for firing of its engines at Convair-Astronautics' Sycamore Canyon facility in Calif. Caterpillar generator set supplies independent ground power.



NEW! Prompt response to speed and load changes with Thompson Turbocharger

Moving parts in the new-design Thompson Turbocharger for diesel engines are made of light alloys to reduce inertia to speed changes. Response of the Thompson Turbocharger to variations in engine speed and air requirements is almost instantaneous... no ragged engine performance due to lag in blowing.

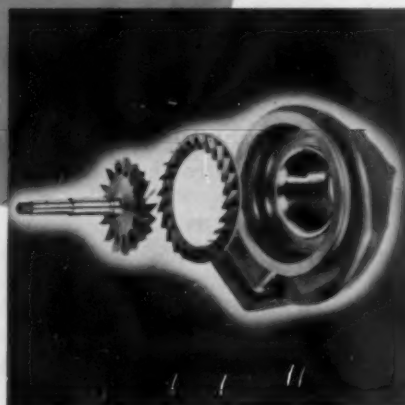
The light alloy impeller also permits bearings to be simpler in design. Shafts can be smaller in diameter to reduce bearing surface speeds and increase bearing life.

Other advantages of the new Thompson design include: straight-bladed impeller for high pressure ratios over wide range of air flow, new-design diffuser for peak performance over wider operating range, and unique design to isolate exhaust heat from bearings and air-side of Turbocharger.

Your diesel engines up to 300 horsepower can readily be equipped with Thompson Turbochargers... the most modern design available. A Tapco Group engineer will call at your convenience to work with your engineers.

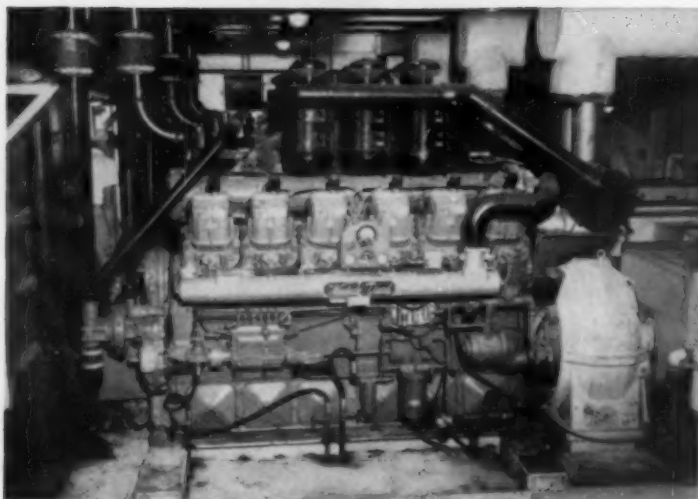


TAPCO GROUP
Thompson Products, Inc.
CLEVELAND 17, OHIO

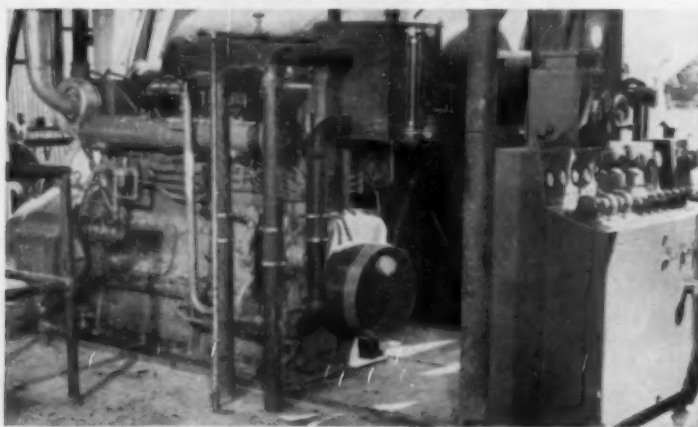


Write today on your company letterhead for Booklet DPR-1158, which contains technical data on Thompson Turbochargers for blown diesel engines up to 300 horsepower.

NEW Two-R Drilling Co. BARGE No. 1



(drilling engines—drawworks and mud pumps)
Three Waukesha VLRDBSU Turbocharged 12-cyl. Diesels

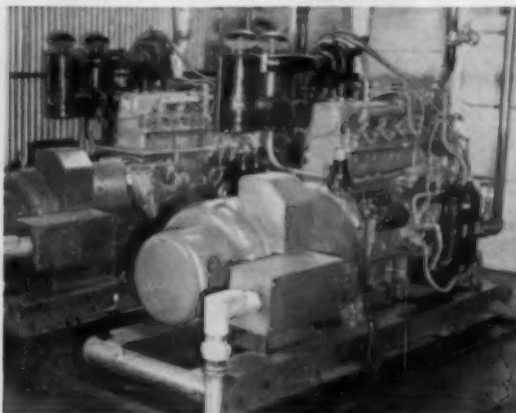


(rotary table drive and catworks)
Waukesha NKDBSU Turbocharged Diesel

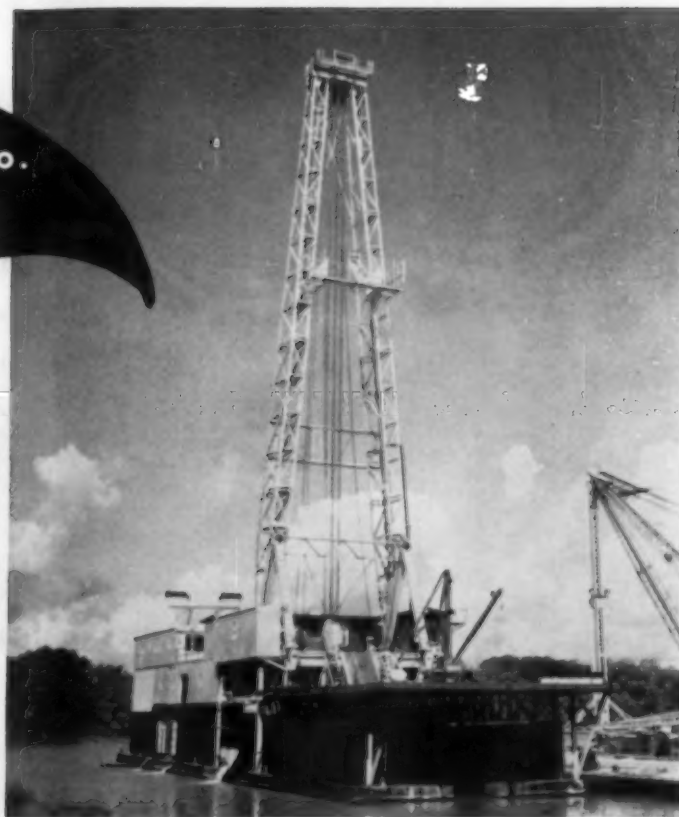
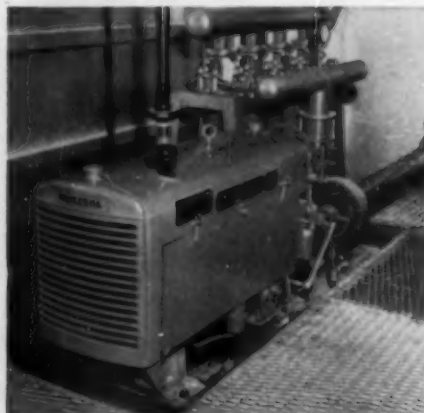
(mud mix pump)
Waukesha WAKDU Normal Diesel



(main electrical power) Two Waukesha WAKDBSU
Turbocharged Diesel 125 KW Engines



(de-sander unit)
Waukesha 190-DLCU Normal Diesel

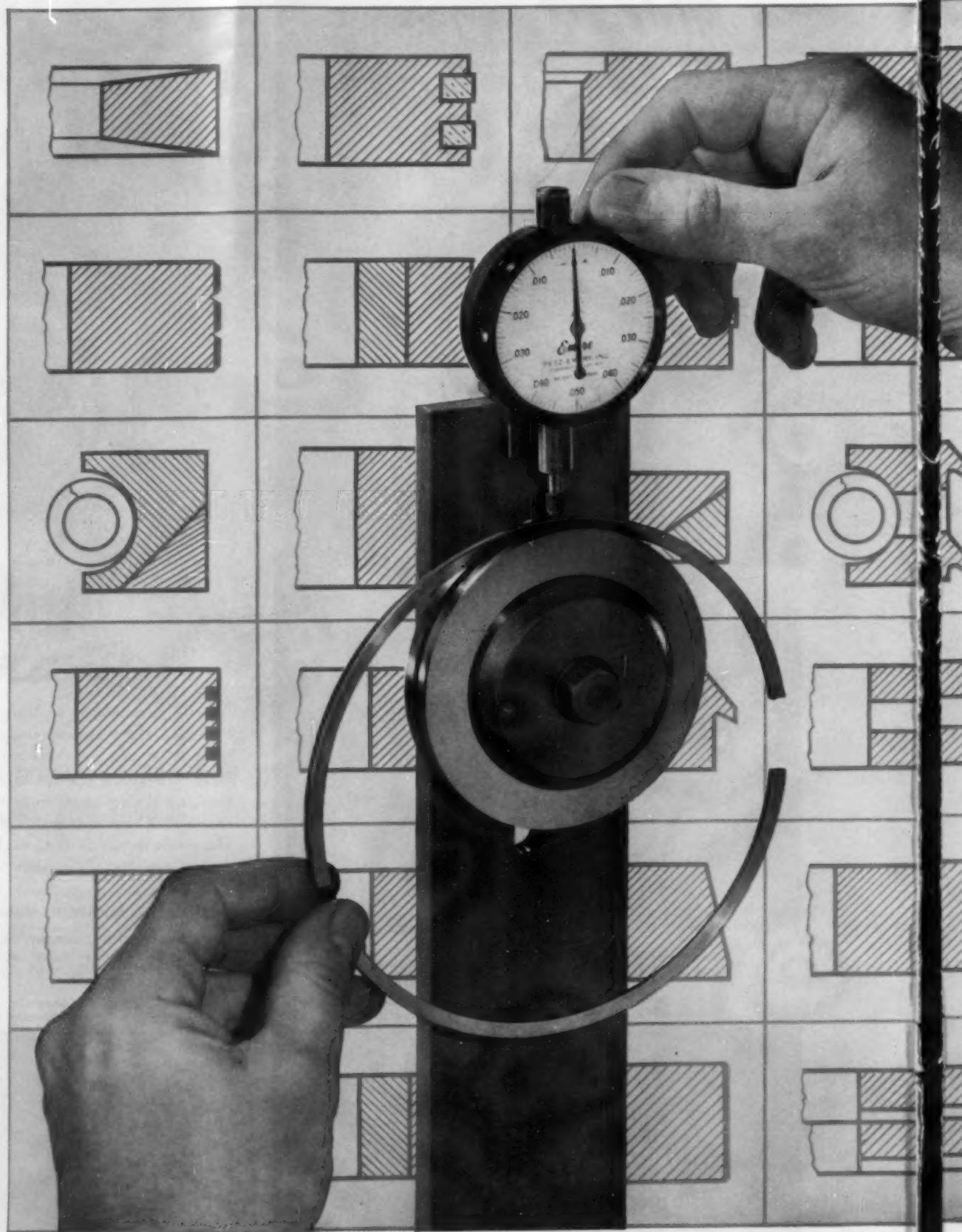


all-WAUKESHA POWERED

Recently commissioned at Morgan City, La., Barge No. 1 has a 25,000' capacity drilling rig. The mast, 142' high x 32' at base, has 1,000,000 lb. lifting capacity. Barge is completely powered by Waukesha Diesel Engines, each of which has its own heat exchanger-surge tank system. The barge itself is 170' long, 45' wide, 12' deep, with a substructure 24' high; has living quarters for 22 men. It was built for Bethlehem Supply Co. by Reagan Tool Co. for delivery to Two-R Drilling Co. Reagan Equipment Co. supplied the Waukeshas. Get bulletins.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
New York • Tulsa • Los Angeles

396



Let's Face It

Koppers holds that a piston ring is no better than its wearing face

Koppers ability to design piston rings with the precise configuration that meets engine requirements can save you operational and maintenance dollars.

You can select from hundreds of ring configurations that provide optimum sealing with predictable performance in most industrial applications while ideally meeting all requirements of oil control and wear resistance. Or, Koppers, with its 36 years of experience, can design a ring to match your specific requirements.

Koppers Piston Rings have proved themselves wherever piston rings are used and particularly where operating conditions are critical... in internal combustion engines, steam engines, pumps, compressors and valves. Look to Koppers for the solution to your piston ring problems. Write for complete information today to: KOPPERS COMPANY, INC., 1411 Hamburg Street, Baltimore 3, Md.



PISTON AND SEALING RINGS

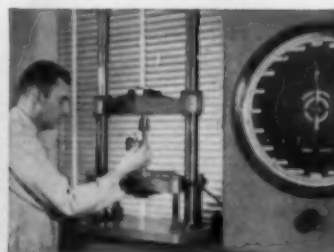
Engineered Products Sold with Service



Fluid Dynamics Knowledge gained by Koppers through many years of experience helps solve the most complicated problems involving the control of gases under pressure.



Face Design Knowledge gives Koppers the ability to produce rings and seals that give reliable and economical performance under the most demanding operating conditions.



Materials Knowledge enables Koppers to select the proper material or combination of metals, plastics or ceramics to insure maximum efficiency and length of service.

an
idea
man's
power...



P&H

DIESELS

*the modern prime mover that gives your equipment
these powerful and exclusive sales features:*

*• Low-speed, high-torque design for heavy work and loads
• Utilized power assemblies - safe without removal of the main shaft
• Fewer parts - all wearing parts completely interchangeable*

plus these performance advantages:

*• Fast cold weather starts • Long life
• High torque • High fuel economy
• Safety • Low maintenance • Low operating costs*

HANN SCHFEGER

Diesel Engine Division • Crystal Lake, Illinois

ENGINE LINE: INDUSTRIAL • AUTOMOTIVE • MARINE

GENERATOR SETS

1 1/2 to 2000 HP Models • 15 to 1000 HP

25 to 1000 HP Models

NOW! CONTINUOUS, FULL POWER TURBOCHARGING



**AiResearch control system
keeps turbocharger output at
ideal level**

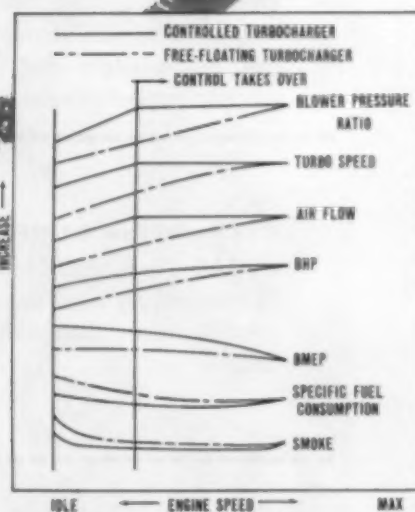


Accurate control of turbocharger speed over its complete range regardless of changing load characteristics has been achieved with the new AiResearch Turbocharger Control System. This automatic control system delivers more air to the engine when needed and greatly increases torque rise, giving turbocharged diesel engines greater lugging ability when operating under heavy loads. By contrast, free-floating turbochargers operate at reduced RPM when the engine is working at below-maximum engine speed.

This improved air delivery sys-

tem greatly increases the acceleration, for example, of turbocharged diesel trucks up steep grades. In a typical case, the round-trip time of a trucking company operating between Phoenix and Denver was cut from 48 hours to 42 hours. Over short hauls an off-the-road truck cut its 27-minute round-trip time to 18 minutes. Comparable gains are made for all types of turbocharged diesel equipment, stationary or mobile.

The two components of the new control system are a pressure ratio sensor and an exhaust by-pass valve. They control the speed of



Improved performance characteristics of a typical turbocharged diesel engine equipped with the new AiResearch Turbocharger Control System.

exhaust-driven turbochargers by modulating the amount of engine exhaust used. This eliminates over-speeding of the turboblower, and at the same time provides higher turboblower speed while lugging. Smoking is virtually eliminated under all conditions.

Your inquiries are invited.

THE GARRETT CORPORATION
AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

FOR ANY LUBE SYSTEM PROTECT YOUR ENGINES WITH



For Full-Flow DEPTH Filtration:

Fulflo Filters with genuine Honeycomb Filter Tubes provide true depth filtration at high or low flow rates for stationary engines, mobile engines or bulk fluids. Every drop is filtered finer and finer — through hundreds of precision controlled filtering tunnels. These diamond-shaped tunnels are engineered for exact uniformity in size, shape, depth and density. Contaminants are securely trapped in inner storage cells.

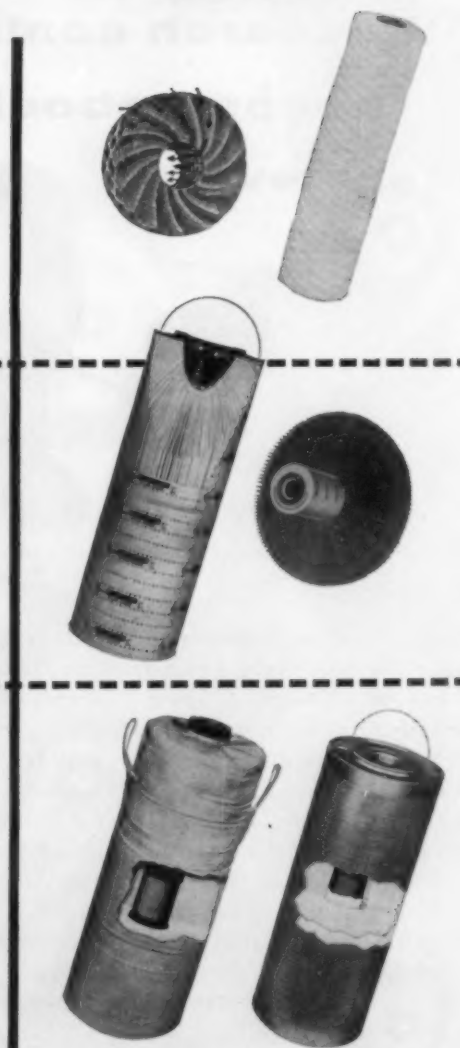
For Full-Flow SURFACE Filtration:

CFC Flo-Pac is offered in a variety of models using 1 to 36 resin-impregnated paper cartridges. Each cartridge provides more than 6300 square inches of filtering surface.

For By-Pass Systems:

CFC Multi-Cartridge Filter offers seven types of interchangeable cartridges — inert media for solid contaminants or Cranite (fuller's earth) for removal of solid particles and all products of oxidation. CFC Michiana Filters are also available in a variety of models for rugged service within minimum space requirement.

For new catalog, write today to Department DS



COMMERCIAL FILTERS CORPORATION
MELROSE 76, MASSACHUSETTS
PLANTS IN MELROSE, MASSACHUSETTS AND LEBANON, INDIANA
MICRO-CLARITY AT MINIMUM COST

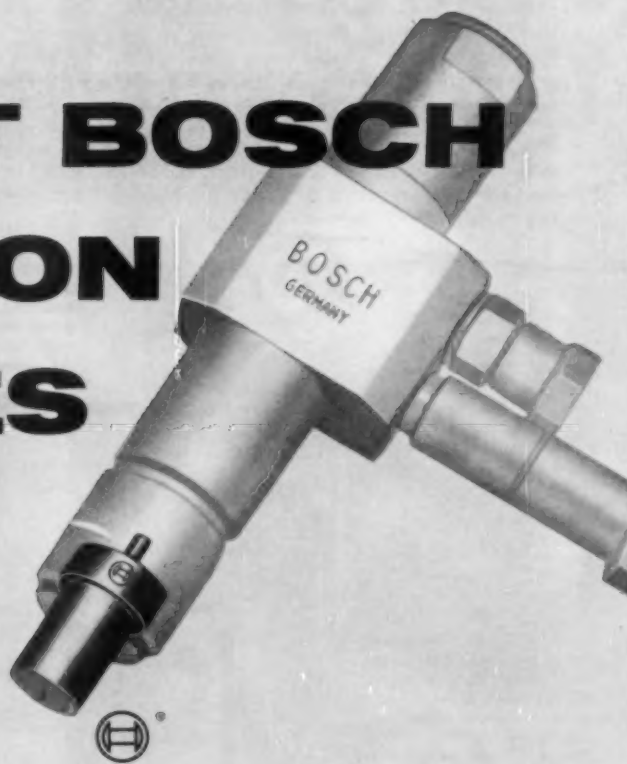


with genuine Honeycomb Filter Tubes for controlled micro-clarity of industrial fluids.



Selective filtration of oils • water-oil separators • magnetic separators • pre-coat filters • coolant clarifiers • automatic tubular conveyors.

6 REASONS WHY IT PAYS TO STANDARDIZE ON ROBERT BOSCH INJECTION NOZZLES



© Reg. U. S. Pat. Off. ROBERT BOSCH GMBH Stuttgart

1: Leadership: ROBERT BOSCH Fuel Injection Equipment made the high-speed diesel engine practicable.

2: Consistent quality: Unmatched record of performance on literally millions of engines.

3: Widest selection: ROBERT BOSCH

offers the most complete line of nozzles available.

4: Service everywhere: Not only nation-wide, but world-wide.

5: Standard equipment: Leading gasoline and diesel engine manufacturers

here and abroad use ROBERT BOSCH equipment for their most advanced designs.

6: Higher quality at lower price: Sets new standards of long-life efficiency—yet actually is priced lower.

ROBERT BOSCH CORPORATION

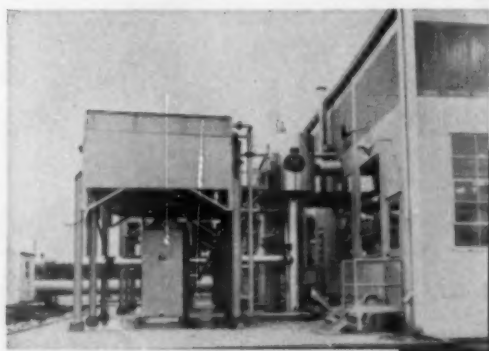
40-25 Crescent St., Long Island City 1, N.Y. 225 Seventh St., San Francisco 3, Calif.

UNITED GAS PIPE LINE CO. INSTALLS VAPOR PHASE® to cool 3 compressor units with own waste heat

*System Increases Engine Output and Life; Reduces
Cylinder Wear; Would Permit Use of Sour Gas Fuel*

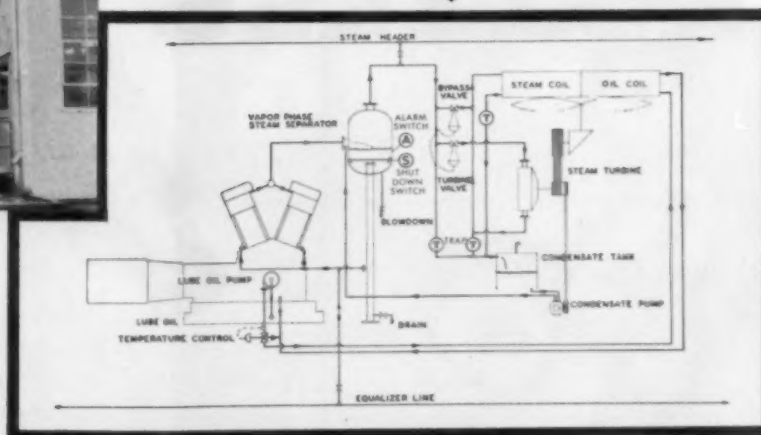
The 3-880 H. P. Gas Compressors at UGPL's Cabeza Creek station, near San Antonio, Tex., installed in 1957, are taking the power to drive their cooling fans from the waste heat of their own operation. The formerly wasted heat is taken from the VAPOR PHASE® separators in the form of low pressure steam. This steam drives the cooling air fans through steam turbines, an exclusive patented feature of the Vapor Phase System.

The decision to install Vapor Phase® Thermal Circulation Cooling was based on the successful operation of a similar installation, made in 1953, on 5-880 H. P. engines at UGPL's Agua Dulce Station which resulted in better combustion, reduced cylinder and ring wear and lowered operating costs.



CABEZA CREEK STATION —
Steam generated from waste heat passes through Vapor Phase® Steam Separator and operates turbine driven fan, condensing the steam and cooling the lube oil. Operating costs are reduced while freeing the engines for greater power output.

VAPOR PHASE® FLOW DIAGRAM — water and steam from the engine power cylinders flow through a header to the Vapor Phase® steam separator. Steam produced powers the turbine driven fan which furnishes air to dissipate engine heat. All condensate is returned to the water and steam header. Water from the separator circulates through the power cylinder jackets by gravity.



"Sole Developers and Manufacturers of Vapor Phase® Thermal Circulation (Ebullition) Engine Cooling"



ENGINEERING CONTROLS, Inc.
AN AFFILIATE OF ST. LOUIS SHIPBUILDING & STEEL CO.

611 East Marceau Street
St. Louis 11, Missouri

1939 North Hillhurst Avenue
Los Angeles 27, California

When It's Time For A Change...



MERCEDES-BENZ Diesel Engines

A wise boat owner gets quality and performance by installing a Mercedes-Benz diesel engine as a new source of power . . . When his boat slides down the ways, ready to take off on its shakedown cruise, a new high in quiet, dependable operation will be under his hatches . . . He'll be amazed at the economy of his new diesel, the way it runs smoothly on hour after hour on a minimum of fuel. And, he'll never get the odor he once did because his Mercedes Benz has smokeless combustion . . . No diesel has been built with greater care and skill, so recognized for superiority at sea. It's the most nearly perfect masterpiece of its kind in the world.



Mercedes-Benz diesel engines are available with 4, 6, 8, 12 and 20 cylinders, turbo and supercharged, up to 3000 horsepower.

UTICA DIVISION
CURTISS-WRIGHT 
CORPORATION • UTICA MICHIGAN

"... no one could
go wrong in buying
a Nordberg engine ..."



says Mr. Walter Scales
Manager
Conway Corporation
Conway, Arkansas

The Conway Light, Power and Water System is owned by the City of Conway, Arkansas, and operated by the Conway Corporation. Mr. Walter Scales, its manager, has this to say about Nordberg power:

"Our first Nordberg engine was installed late in 1951. That engine now has over 36,000 hours of running time on it. During the calendar years 1952 thru 1956 the engine was on the line 75% of the possible running time. During one period of 43 consecutive months the engine was operated over 90% of the possible running time and accounted for 75% of our total plant generation during that period.

"Our second Nordberg went into operation in 1956 and now has over 8,000 hours on it. There is every indication that it will be as satisfactory, and even more economical, than the first engine. Our opinion is that no one could go wrong in buying a Nordberg engine."

When you need long-term, dependable power, consult Nordberg . . . builders of a full line of engine sizes from 600 to over 12,000 hp, including Diesel, Duafuel® and Spark-Ignition Gas types. NORDBERG MFG. CO., Milwaukee, Wisconsin

Installation Data:

City of Conway, Arkansas:

Two Nordberg 2-cycle Duafuel® engines installed, total of 6225 hp.

- First engine installed late 1951 . . . rated 2750 hp, 1940 kw.
- Second engine installed late 1955 . . . rated 3475 hp, 2470 kw.

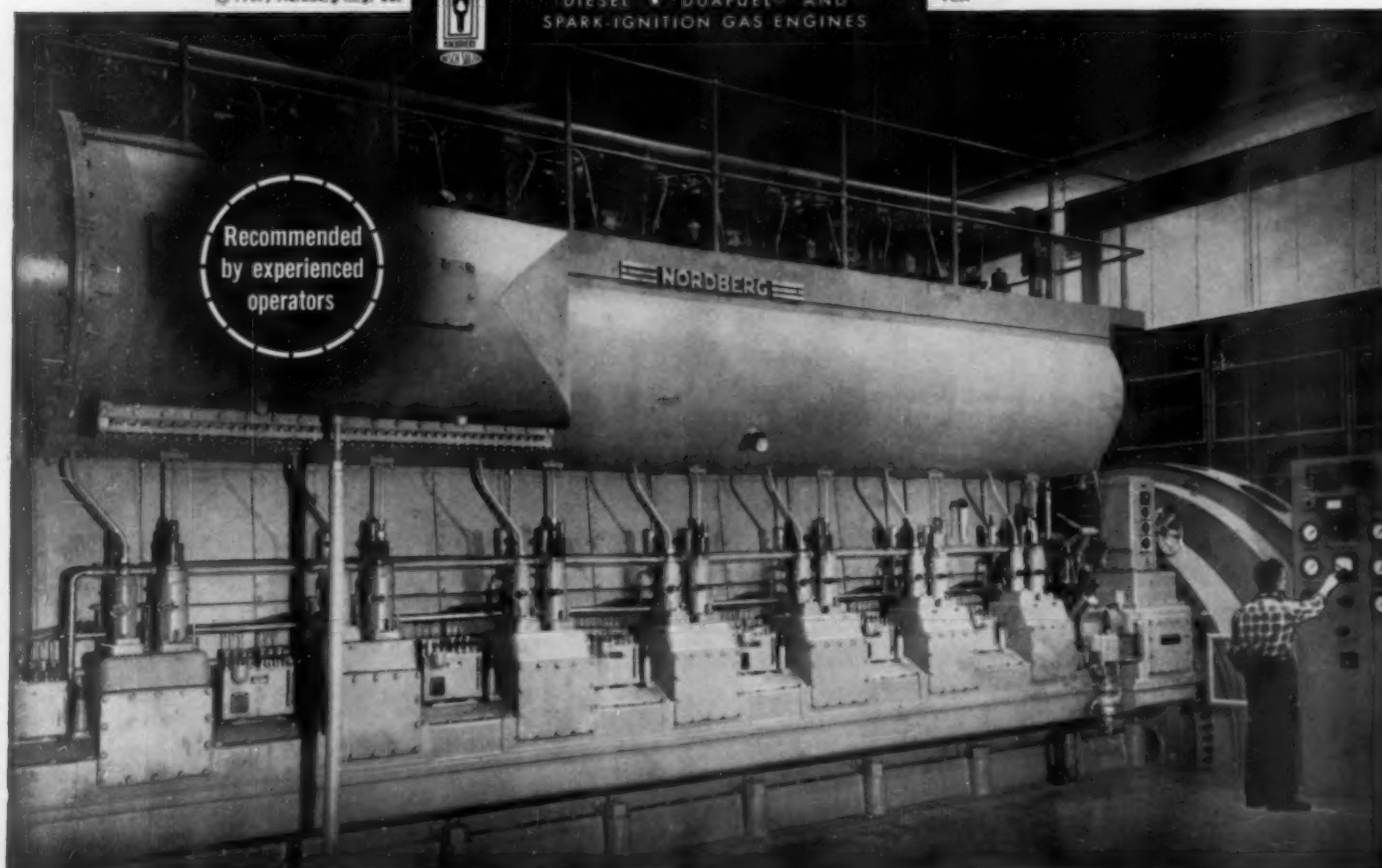
NORDBERG

© 1957, Nordberg Mfg. Co.



DIESEL • DUAFUEL® AND
SPARK-IGNITION GAS ENGINES

P637





New Spicer Synchro-Master 12-Speed Transmission saves fuel...saves weight...lets you add to payload

Conserve your engine rpm between shifts with the new close-stepped Synchro-Master 12-speed Transmission. In actual tests the Synchro-Master 12 stepped through the gears with no more than 22% reduction from maximum rpm. That's the kind of efficiency you want to keep your diesels operating in the peak speed range and to save precious fuel.

Here are the results of tests made with a Synchro-Master 12 Transmission and a 2100 rpm diesel engine . . .

Lowest speed between shifts . . . 1635 rpm, or a 22% loss of engine speed.

Average speed between shifts . . . 1662 rpm, or a 21% loss of engine speed.

Isn't this proof that the Synchro-Master 12 will handle all road and load conditions without the aid of auxiliary transmission or two-speed axles?

In addition to close-stepped ratios, the Synchro-Master 12 has two features that help the driver keep his diesel operating with high efficiency and economy. They are — air shifts controlled by "Splitter" and "Hi-Low Range" selectors and blocker-type synchronizers for all forward and reverse gears. Thus, there's no need to double-clutch and the driver can skip-shift when loads and conditions permit.

200 pounds lighter and 12 inches shorter than any comparable transmission, the Synchro-Master 12 reduces weight under the 5th wheel in addition to eliminating heavy two-speed axles or overhanging auxiliary transmissions. It all adds up to extra payload for every trip made with the Synchro-Master 12.

Gear up the modern way with the Spicer Synchro-Master 12-speed transmission. You'll save fuel, you'll save weight, you'll pack on extra payload for every trip.



DANA CORPORATION • Toledo 1, Ohio

DANA PRODUCTS Serve Many Fields:

AUTOMOTIVE: Transmissions, Universal Joints, Propeller Shafts, Axles, Power-Lok Differentials, Torque Converters, Gear Boxes, Power Take-Offs, Power Take-Off Joints, Clutches, Frames, Forgings, Stampings.

INDUSTRIAL VEHICLES AND EQUIPMENT: Transmissions, Universal Joints, Propeller Shafts, Axles, Gear Boxes, Clutches, Forgings, Stampings.

AVIATION: Universal Joints, Propeller Shafts, Axles, Gears, Forgings, Stampings.

Many of these products manufactured in Canada by Hayes Steel Products Limited, Merriton, Ontario.

RAILROAD: Transmissions, Universal Joints, Propeller Shafts, Generator Drives, Rail Car Drives, Pressed Steel Parts, Traction Motor Drives, Forgings, Stampings.

AGRICULTURE: Universal Joints, Propeller Shafts, Axles, Power Take-Offs, Power Take-Off Joints, Clutches, Forgings, Stampings.

MARINE: Universal Joints, Propeller Shafts, Gear Boxes, Forgings, Stampings.



THIS MUCH DIRT CAN RUIN A DIESEL ENGINE



THIS PUROLATOR FILTER



STOPPED THIS MUCH DIRT

Diesels can't escape abrasive dirt . . . and it takes about 8 ounces of it to ruin an engine.

The 18 pounds of dirt shown above were stopped by a Purolator heavy duty dry type air filter on a rock drilling rig in 940 hours of operation—with no servicing of the filter required. The 6 cylinder, 2 cycle engine and the 750 CFM compressor used on the job were fully

protected through the toughest operating conditions. 18 pounds of dirt were stopped . . . none got through the filter.

There's a Purolator dry type air filter designed to meet the specific requirements of your operation. Write today for full information. If you have a particularly tough problem, describe it . . . Purolator has the solution.

Filtration For Every Known Fluid

PUROLATOR

PRODUCTS, INC.

RAHWAY, NEW JERSEY AND TORONTO, ONTARIO, CANADA



PICTURES AND
INFORMATION ON
NEARLY 2,000
TIME-SAVING
WORK-SAVING TOOLS

YOU'LL NEED IT IF
YOU DO WORK ON

- Engines
- Transmissions
- Rear axles
- Steering
- Chassis suspension and brakes
- Bodies and accessories
- General repairs

Your Free Guide

TO FASTER, EASIER, MORE ECONOMICAL REPAIRS
WITH **FACTORY-APPROVED** TOOLS

Kent-Moore's giant new Industrial Catalog, the first of its kind ever offered in the vehicle maintenance and repair field, contains 120 pages devoted expressly to the easy, economical and factory-perfect servicing of all major makes of trucks—plus a variety of gas and diesel power industrial

and construction equipment. Profusely illustrated and indexed for ready reference, it's the only complete guide available today that lists thousands of special tools, gauges and other precision equipment designed to meet every service need.

**FREE PLASTIC
BINDER IF YOU
SEND THIS CARD
TODAY** →

Durable plastic-coated binder is completely "shop-proof"—grease can't hurt it, and it stays scratch-free for years of everyday use. You'll want this valuable binder to protect your catalog and supplementary catalog sheets sent regularly without charge. It's yours **FREE**, if you act now!

KENT - MOORE ORGANIZATION, INC.
28635 MOUND ROAD • WARREN, MICHIGAN



Please send me free of charge _____ copies of your complete service tool catalog with plastic binder.

Company _____ Date _____

Name _____ Title _____

Address _____ City _____ State _____

Please check appropriate boxes so that supplemental literature may be supplied to you when released.

☐ Dealer for _____

☐ Distributor for _____

☐ Contractor-type of work performed _____

☐ Fleet

☐ Government Agency ☐ Federal ☐ State ☐ Local

☐ Other—please specify _____

Specify Number and Make

☐ Agricultural ☐ Truck

☐ Construction ☐ Engine

No. _____ Make _____

Total

Type of Service Jobs Performed
in Your Shop

☐ Complete Overhaul ☐ Engine

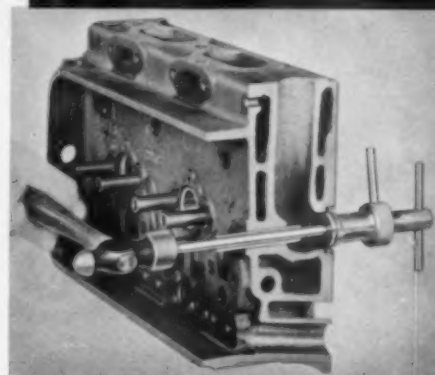
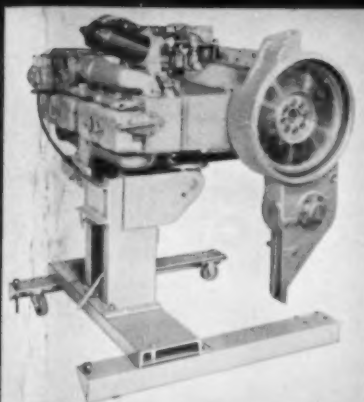
☐ Axles (Front & Rear) ☐ Chassis

☐ Transmission ☐ Other

No. of Mechanics _____

No. of Field Service Trucks

Operating _____



Make the Tough Jobs Easy!

**You'll Get "FACTORY-APPROVED"
Repair Jobs With K-M
Work-Saving, Time-Saving Tools**

Check your Shop Manuals—see how often Kent-Moore "J"—numbered tools are recommended for service operations that can't be done efficiently or properly with ordinary tools! "Rate-Maker" Service Tools are designed in close cooperation with the equipment manufacturer to duplicate factory-assembled conditions in the field. They save time, prevent parts damage and reduce vehicle downtime because they're the *right* tools for every job! Whatever your service needs—routine body or chassis maintenance, tune-ups or major overhauls—specify Kent-Moore "Rate-Maker" Service Tools for a better job, done in less time, to factory "specs".

SB-F5

Postage
Will be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

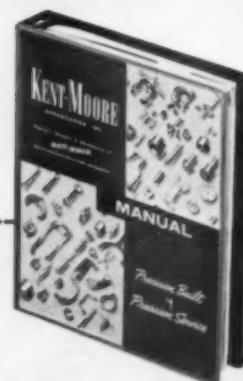
BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 5876, SEC. 34.9, P.L.B., DETROIT, MICHIGAN

KENT-MOORE ORGANIZATION, INC.

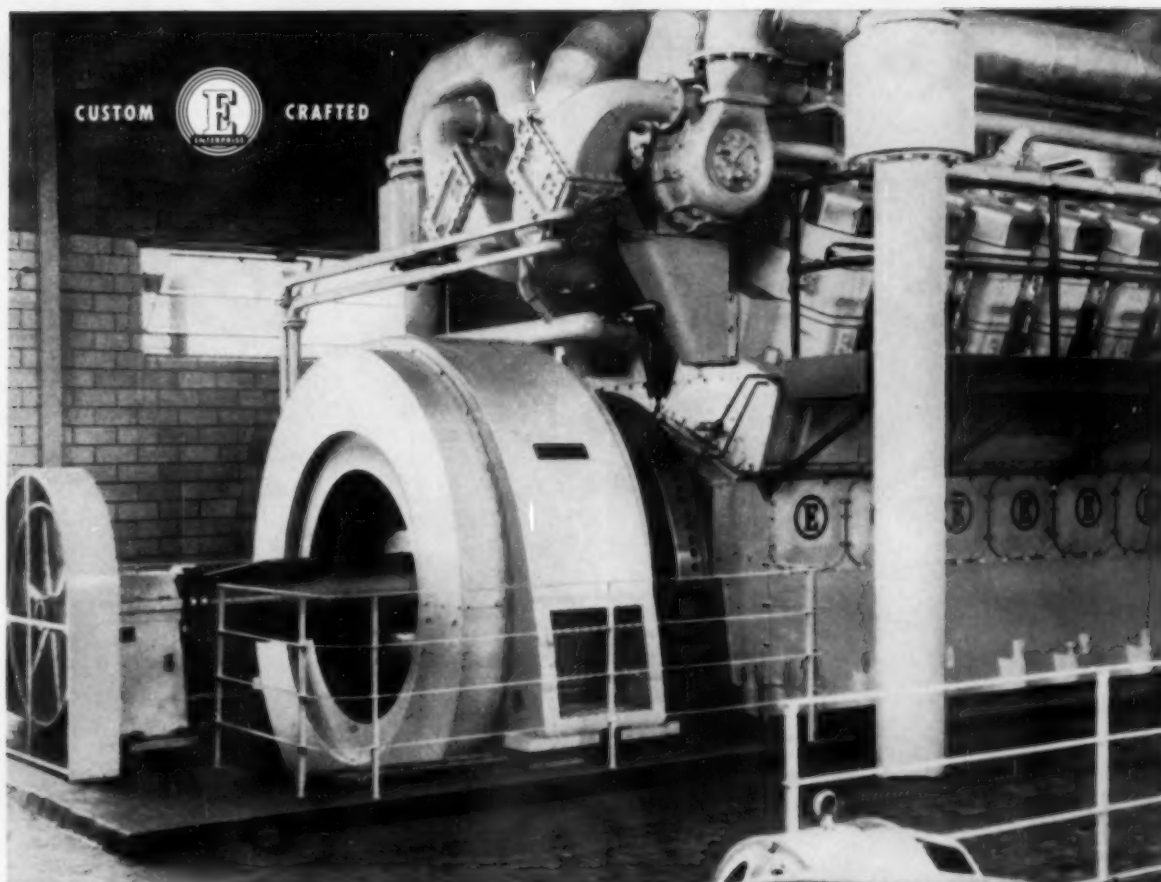
28635 MOUND ROAD

WARREN, MICHIGAN



**Send postcard
today!**

Big new Kent-Moore Catalog is packed with pictures and information on "Rate-Maker" Special Service Tools and Equipment on all major makes of trucks and heavy equipment.



World's Smallest Big-Horsepower Engine Now at Work for Waverly, Iowa

This Enterprise 16-cylinder Turbocharged Dual Fuel Engine is now "on the line" for the Municipal Electric Utility of Waverly, Iowa. It is the largest, most powerful engine ever built by Enterprise—yet its dimensions and weight make it the world's smallest engine in relation to its horsepower output. The Waverly engine is rated 4,890 hp—3,500 kw—at 360 rpm. Top-rated capacity of the RV: 7700 hp at 400 rpm.

Located in Waverly's West Light Plant, the Enterprise unit more than doubles the previous kw capacity of this facility, and is also generating more power than the city's East Plant with its 4 engines and 3 hydro units.

As with other custom-crafted models in the complete Enterprise line, this 110-ton engine offers many advantages which cut installation, operating and maintenance costs. Less bulk makes installation easier, servicing simpler and more economical. Maintenance requires no major disassembly because all working parts are readily accessible from the outside.

Investigate this "workhorse" source of dependable, low-cost power—the result of nearly four decades of experience, research and development. Write for Bulletin ES-B69, or ask for a representative to call.

With its new 4 cycle, 17" bore x 21" stroke RV-16 Enterprise, the Waverly installation has become known as a "showplace among the power plants of the nation."



DEPENDABLE ENGINES

ENTERPRISE
engine & machinery co.

Subsidiary of General Metals Corporation
18th and Florida Streets, San Francisco 10, California

Boston • Chicago • Des Moines • Jacksonville • Kansas City • Los Angeles • New Orleans
New York • Pittsburgh • San Diego • Seattle • St. Louis • Washington, D. C.



Geared by FULLER... ...ROADRANGERS® help move 86 tons

Efficiency, speed and maximum payload are emphasized in the Peabody Coal Company's operation of the River King coal mine near Freeburg, Illinois.

Single-stick, 9-speed Fuller R-1150 ROADRANGER Transmissions are a feature of the Cummins Diesel-powered Euclid tractors used by Peabody to pull loads from the strip mine to the preparation plant five miles away. Euclid trailers of 72 cubic yard heaped capacity are loaded to an average payload of 55 tons, and gross vehicle weights run to almost 86 tons.

Peabody stresses mobility, keeping truck speeds as high as possible, pro-

viding in-motion dumping at the preparation plant, and minimizing the necessity for stopping and reversing. The Fuller R-1150 ROADRANGER Transmissions used at the River King Mine are built specifically for heavy-duty, off-highway operation. Peabody officials are highly satisfied with the performance of the ROADRANGERS used in their operation.

Fuller R-1150 ROADRANGER Transmissions offer these important advantages:

- No gear splitting — 9 selective ratios are evenly and progressively spaced.
- Easier, quicker shifts—38% steps

between ratios.

- One shift lever controls all 9 forward and 1 reverse speeds.
- Engines operate in peak hp range with greater fuel economy.
- Less operator fatigue — 1/3 less shifting.
- Range shifts pre-selected — automatic and synchronized.



FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich.
Subsidiary, Eaton Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

The Engineer's Field Report

CASE HISTORY

Chevron Starting Fluid
PRODUCT

Great Northern Railway
FIRM *Haure, Montana*

Special fluid starts 250-ton crane instantly, saves time in emergencies—even at 50° below



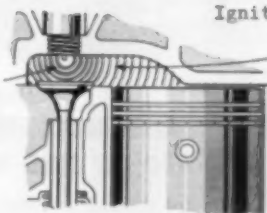
GREAT NORTHERN RAILWAY'S 250-TON, RAILROAD CRANE (above) starts instantly with Chevron Starting Fluid in temperatures ranging to 50° below zero—even after standing idle for months at a time. Former steam-powered wrecker equipment took crew 12 hours to start. This crane with its two 174 h.p. Cummins diesel engines is now available for derailment emergencies on short notice.

"Slow-grind starts on battery power alone waste too much valuable time. Chevron Starting Fluid fires

these engines 'right now'—in any weather." A Great Northern engineer shows how simple it is to insert 7CC gelatin capsule of Chevron Starting Fluid in unit's air-intake system. Fluid is also available in 17CC capsules and 1-pint cans.

Why Chevron Starting Fluid starts engines instantly

Highly
volatile:
7 times
more than
gasoline



Ignition temperature
several hundred
degrees lower
than diesel
fuel

Contains wear-
reducing lubricants

Additives inhibit
ice formation



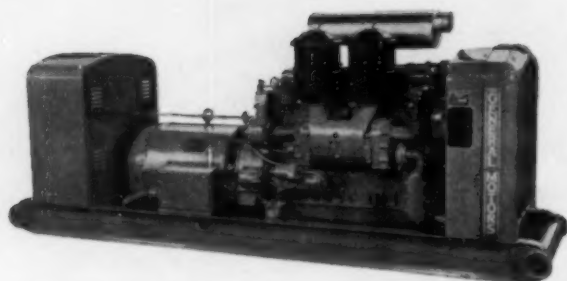
FREE FOLDERS Tell more about the Chevron Starting Fluid and Chevron Pressure Primer System. Write or ask for them.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies listed below.

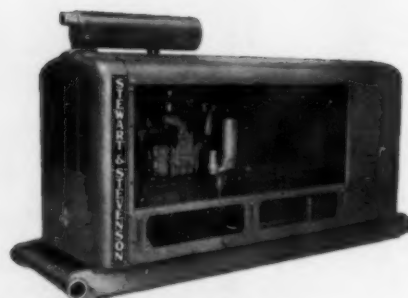
TRADEMARKS "CHEVRON" AND DESIGN REG. U. S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado





OPEN TYPE



CLOSED TYPE

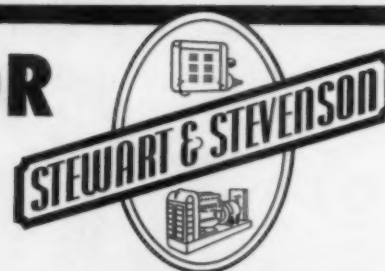
From the world's
most experienced
producers of

ENGINE GENERATOR SETS

1500 Watts
to 1000 Kilowatts



TRAILER MOUNTED



Stewart & Stevenson provides the most complete range of performance-proved engine generator sets. Combination Oil Field Utility Units, Rig Lighting Plants, A.C. Units, D.C. Units, heat exchanger cooled, radiator cooled, portable or stationary, explosion proof, standard type or custom built for any need.

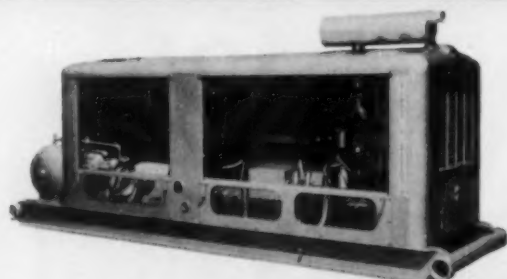
Select the kind of power you prefer—Diesel, Natural Gas or LPG. Call, write or wire today for complete information on your engine generator set requirements.

STEWART & STEVENSON SERVICES, INC.

Main Office and Plant: 4516 Harrisburg Blvd.,
Phone CApital 5-5341 Houston 11, Texas

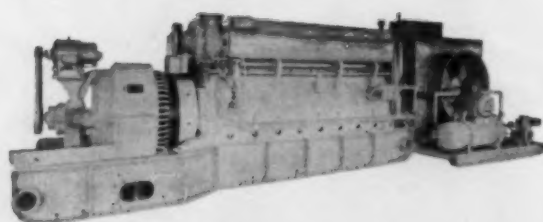
Export: Room 1405, 74 Trinity Place, New York, N. Y.

THE WORLD'S LARGEST DISTRIBUTOR OF DIESEL ENGINES

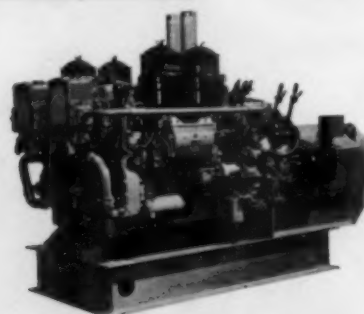


UTILITY UNIT

450 KW SKID MOUNTED



HEAT EXCHANGER TYPE



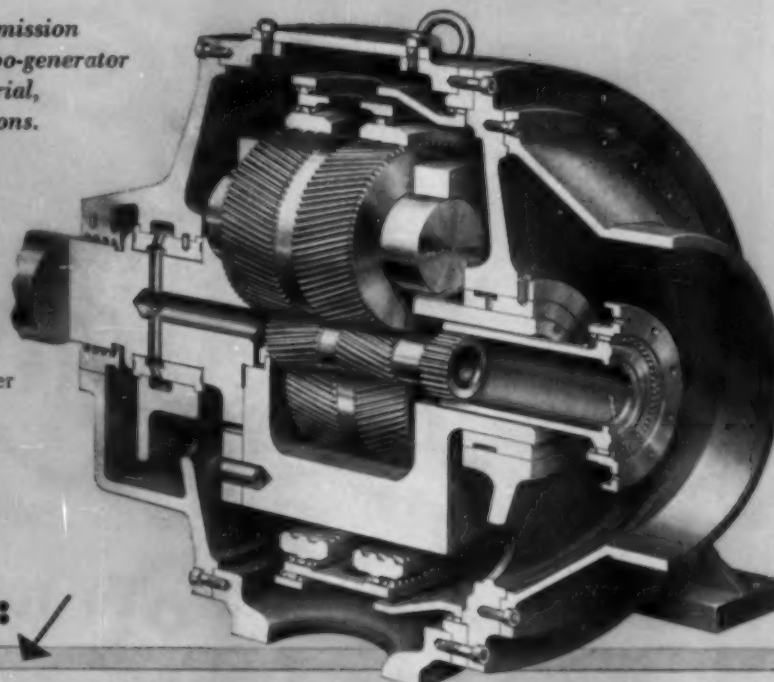
DE LAVAL-STOECKICHT PLANETARY GEAR

...for high speeds...high horsepower

**Proved in hundreds of installations abroad
totalling over 3,000,000 horsepower—now available in America!**

*For all high torque power transmission
applications such as pump turbo-generator
and compressor drives in industrial,
municipal and marine installations.*

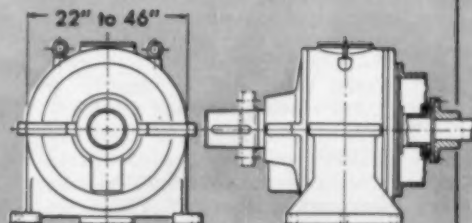
This cutaway view of the De Laval-Stoeckicht Planetary Gear shows how it provides flexibility for proper load distribution throughout the gear members. The thoroughly proved and tested design is completely reliable in transmitting high horsepower for high speed applications. • Highest efficiencies (98% or higher) ... no high speed bearings ... less friction losses.



Check These Advantages:

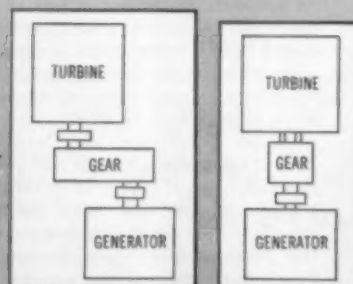
Small Size — Light Weight

Compact—low weight per hp. Sizes range from 22" to 46" in diameter, depending on horsepower requirements. Example: 5000 hp planetary unit weighs 1700 lbs. against 6000 lbs. for conventional gear.



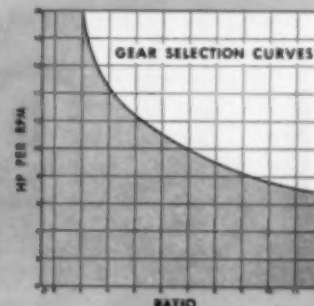
Convenient Arrangement

Co-axial or "in-line" arrangement of gear members takes up far less space than parallel axis gears of equivalent horsepower rating.



Wide Application

Capacity range shown in shaded area on chart below. For other applications, contact your De Laval Sales Engineer.



For further details,
write for Bulletin 2400.



DE LAVAL *Steam Turbine Company*

883 Nottingham Way, Trenton 2, New Jersey



SYLVIA WILKS GETS A NEW YORK WELCOME!

The new *Sylvia Wilks*, first fireboat to be named for a woman, got a typical VIP welcome in New York



Lt. John Collins, supervising engineer, Marine Division, New York Fire Department, checks on one of the four Enterprise diesel engines with Bendix fuel injection which power the *Sylvia Wilks*.

Harbor when she recently joined the world's largest floating fire department. She embodies a lot of new design characteristics and improved equipment which make her one of the best fireboats in the business.

For example she is relatively small as fireboats go, only 105 feet. But it gives her maneuverability not possessed by the other boats of the fleet. She's powered by four turbo-charged Enterprise diesel engines equipped with Bendix® fuel injection—two each for propulsion and pumping. This setup gives the boat full pumping power at all times in contrast to many fireboats that have pumping mechanisms taking their power from the propulsion engines, leaving the vessel handicapped for speed if the

need should arise for both full pumping and propulsion power simultaneously.

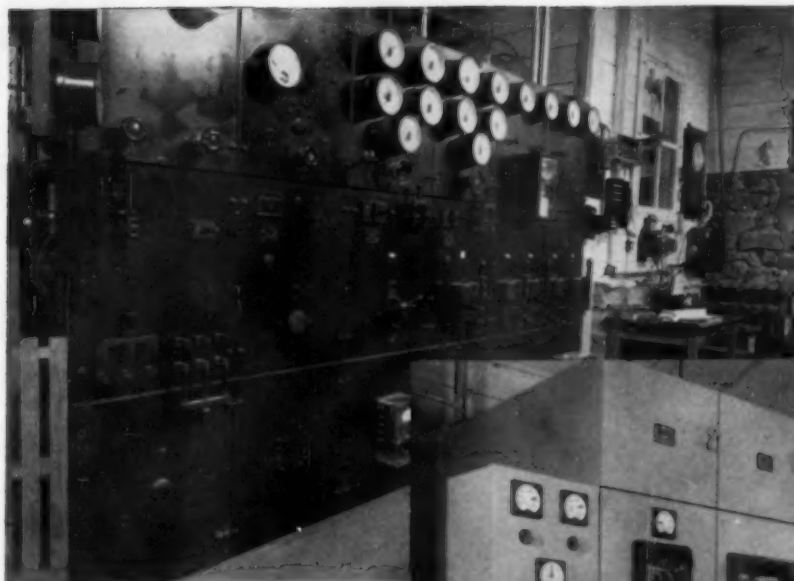
Bendix fuel injection is on the *Sylvia Wilks'* engines for the same reason it is on diesel engines in many other fields—dependable, economical performance around the clock. Locomotives, tugs, towboats, and petroleum pipeline operators use it; in remote spots such as Thule, Greenland, where dependability is priceless, Bendix diesel fuel injection is on electric power generating engines.

For more information about this quality equipment, please write Scintilla Division of Bendix Aviation Corporation, Sidney, N. Y.

Export Sales and Service: Bendix International Division,
205 East 42nd St., New York 17, N.Y.

Scintilla Division
SIDNEY, N. Y.





Old

Old switchgear at Big Falls, Minnesota hydroplant of Border Counties Power Cooperative, Inc. System expansions had caused this board to become dangerous by today's standards, capacity insufficient, and increasingly tedious to handle.

New

Custom-designed by E-M from standard components, this new switchgear at Big Falls gives extra safety and convenience. All apparatus is completely enclosed, yet readily accessible because of E-M's specially designed Swing-Door Instrument Panels. Operation, inspection, and testing is safe, convenient, and simple.



Making switchgear meet power system expansions

● Power systems grow larger . . . and larger . . . and larger. Electrical apparatus of all types must keep pace with this rapid expansion. The plant switchgear, with its vital safety and control functions, must be closely matched to increased demands made upon it.

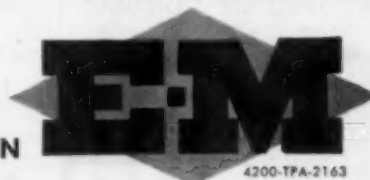
At Border Counties Power Cooperative, Inc., size of the system *tripled*. Having had previous experience with E-M's personalized engineering assistance and with the safety and service of E-M designed apparatus, they called on E-M engineers to work out the new switchgear with consulting engineers R. D. Thomas and Associates.

Equipment necessary to handle the greatly increased system had to be fitted deftly into available space. This made E-M's Swing-Door Instrument Panel a natural choice, as this panel makes use of every available inch of space, both on door and interior of cabinet. Mounted on hinges, the Swing-Door Panel opens as a door to

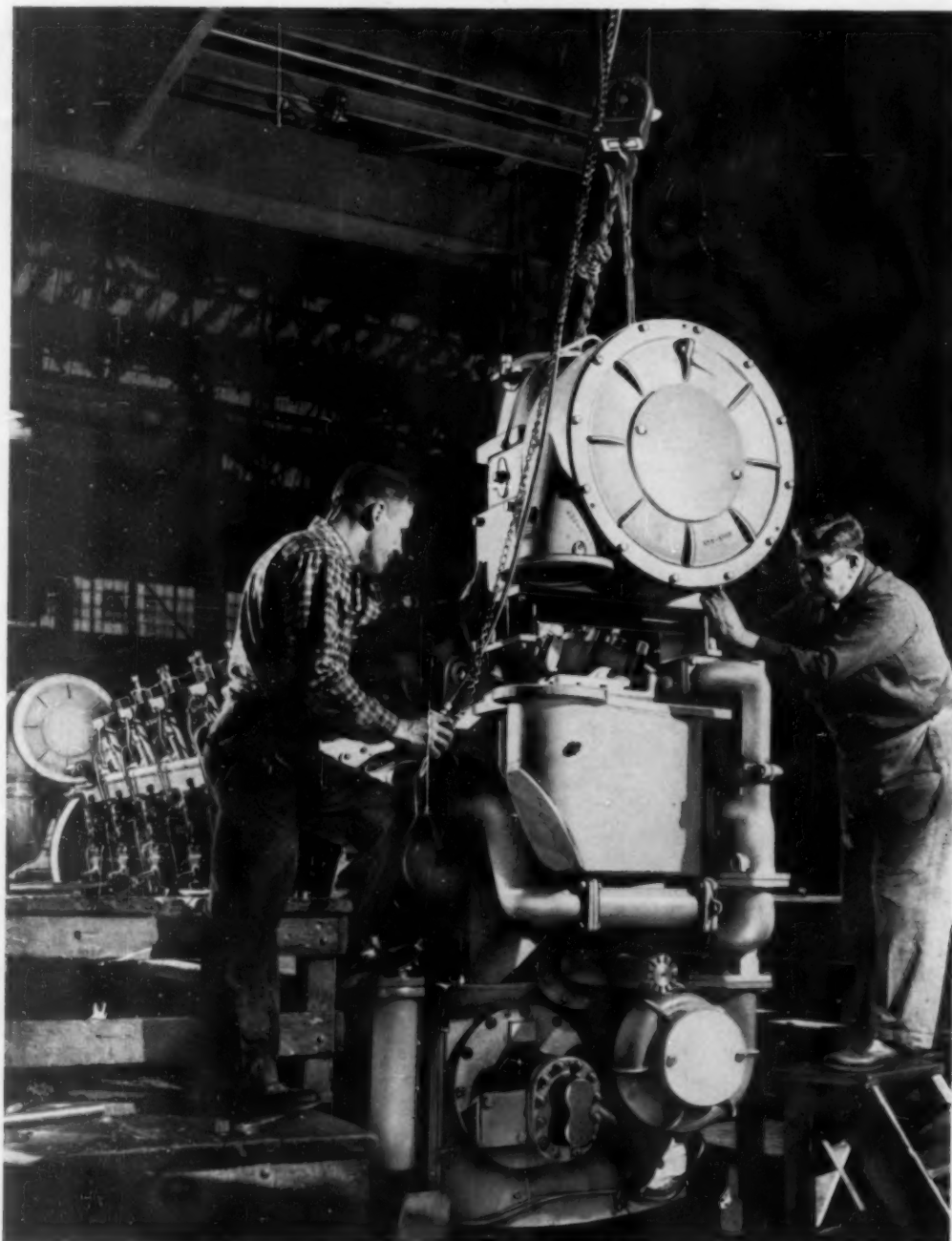
reveal a compact, easy-to-reach arrangement of components, all accessible without reaching across buses or terminals. The E-M Switchgear is designed for tomorrow's increased loads as well, with breakers of adequate interrupting capacity.

"Personalizing" of E-M Switchgear, as was done at Big Falls, means that each E-M board is *matched exactly* to what it will encounter in daily service. This complete, attentive, and highly specialized E-M engineering can be of service to you. Call your nearest E-M sales engineer for more facts, and be sure to write the factory for E-M Switchgear Publication No. 194.

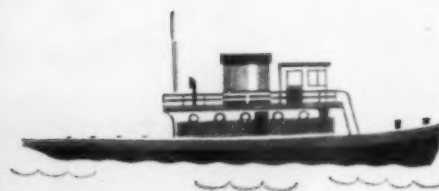
ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA



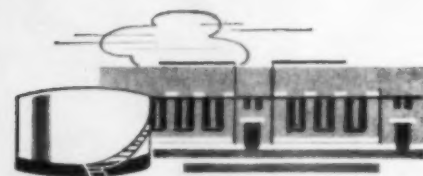
Specialists in MODERN SWITCHGEAR DESIGN



For added power with higher overall efficiency, the ALCO turbosupercharger is an integral part of each ALCO diesel engine in the 750-2400 hp range.



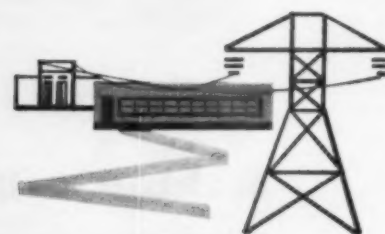
MARINE



PIPELINE



LOCOMOTIVE



POWER GENERATION

A BIG POWER BONUS is added to every ALCO diesel engine with turbosupercharging. ALCO first introduced diesel turbocharging in 1936, and today ALCO alone builds a complete line of engines and turbochargers as matched components. Proved in railroad, pipeline, power-generating, marine and oil-drilling service, a turbocharged ALCO 251 diesel in your next installation will provide the extra margin of profit that modern operations demand.



ALCO PRODUCTS, INC.
TRANSPORTATION PRODUCTS DIVISION
SCHENECTADY, NEW YORK

DIESEL-ELECTRIC LOCOMOTIVES • DIESEL ENGINES • RENEWAL AND MODERNIZATION PARTS • REPAIR AND REBUILD SERVICES

MIGHTY OAHE DAM MOVES AHEAD

By L. H. HOUCK



ONE of the largest aggregations of dieselized equipment ever concentrated on a single job by one contractor is the group on the \$321 million Oahe Dam in South Dakota by Western Contracting Corp., Sioux City, Ia. Here Western is making world dirt moving records in its fifth contract involving 24,500,000 cu. yds. of excavation and 12,000,000 cu. yds. of dam emplacement. Oahe Dam, on the Missouri River, near Pierre, S. D., uppermost of the main stream reservoirs in the Omaha District of the Corps of Engineers, U. S. Army, is the largest rolled earth-fill dam in the world built by the load-and-haul method. Specifically, it is second only to Fort Peck Dam in Montana, which was built by the hydraulic method. Oahe was started in 1948, is now about 35 per cent complete and scheduled for completion in 1960. Almost \$89 million were allotted in 1957 and \$28 million was appropriated in 1958 and by the end of the year \$115,600,000 will have been expended. The schedule calls for 39 per cent completion at the end of the 1959 fiscal year and a total

expenditure at that time of \$154,400,000. While good weather helped, it is a tribute to diesel powered equipment and the ingenuity and efficiency of the contractor that the giant project is much ahead of schedule.

The rolled earth embankment requires 91,000,000 cu. yds. of fill. The crest from abutment to abutment is 9,300 ft. long. Maximum height is 242 ft. Upstream face is rip-rapped with rock to protect against wave action. Width at base is 3,500 ft. and width at crest is 60 ft. Spillway has a crest of 670 ft. and a gated chute with a capacity of 319,000 ft.³/sec. The outlet works requires 17,000,000 cu. ft. of excavation and consists of six concrete lined tunnels. The hydro-electric power installation includes seven power tunnels, with penstocks 24 ft. in diameter and requiring 33,000,000 cu. yds. of excavation. The power installation will consist of seven 85,000 kw generators, making a total of 595,000 kw. Economic benefits will be tremendous. Hydro-electric power will be furnished at moder-

In circle—a Euclid TS-24 twin-power scraper rolls up the main embankment. Above—Rig at right is driving steel piling to refusal at the toe of the dam. Manitowoc 4500 is laying track ahead of pile driver. Caterpillar D9 crawler at right is pushing a loaded Euclid through a mud hole.

ate cost in a power-short area. Irrigation water will be available to large areas of arid and semi-arid lands and flood protection will be afforded to 1,123 miles along the cantankerous Missouri River from Pierre to the Mississippi. A 250-mile long reservoir created by the dam will stretch northward to Bismarck, N. D., to become the largest man-made lake in the world, deeper than Lake Erie, with 2,500 miles of shore line. This will create a new recreational and resort region. Surveys made by the Corps of Engineers show benefits from irrigation, power, navigation and flood control, of \$1.37 for each \$1 expended.

Oahe, highest dam in the plan of the Pick-Sloan Flood Control Act of 1944, is the key structure in



Marion 151-M dragline loading out trucks with an 8½ cu. yd. bucket.



a 529,000 sq. mi. area, which comprises the Missouri River Basin, a sixth of the land area of the nation and a fourth of the nation's farm land. This area is eight times greater than New England and includes all or parts of 10 states—Montana, Wyoming, Colorado, North and South Dakota, Nebraska, Kansas, Iowa, Missouri and Minnesota. The overall Missouri Basin project is described in the World Almanac as the largest engineering project in the world. It involves Garrison Dam in North Dakota, Oahe, Fort Randall and Gavins Point in South Dakota. The Corps of Engineers is in charge of plans and supervision of contractors in the gigantic project.

Such large undertakings become economically possible only because of the ability to obtain and concentrate diesel power in large quantities and the inherent economy of the diesel engine. Nibbles at such large excavation yardages with small forces and small power would delay completion for a century. By throwing in plenty of diesel power, plus know-how and highly trained supervisory personnel, Western has established world's records for dirt moving. Throwing in plenty of power at the drawbar has made it possible, too, to use direct scraper-haul methods in hard slate-like shale, eliminating some of the drilling, blasting and loading in some hard sections with a subsequent high ratio of tonnage to time. In some rock sections blasting has been used to loosen up shale beds for easier scraping as well as to shatter for loading by shovels. High capacity shovels and draglines, big scrapers and big trucks are combined to literally make "the dirt fly."

Blast hole drilling is handled by two drills—a Reich rotary mounted on a D8 Caterpillar trac-

tor, drilling 4½ in. holes to average depths of 25 ft. and a Geo. Failing drill mounted on an International L-180 truck, supplied with compressed air from a Mobil-Air Ingersoll-Rand compressor, powered with a 6-71 GM diesel. Heavy, large capacity loading equipment is standard with Western. Two 191-M shovels, largest made on two crawlers, with bobbed dipper sticks, swing over-size 13 cu. yd. dippers—3 cu. yds. in excess of their rated capacity. These are electric machines and are used on both high lines and supplied from their own diesel-electric plants depending on the cost. Western's field diesel-electric plant, has two Cleveland V-16 2-cycle diesel generator sets. These two GM engines are rated at 1640 hp each. The power plant is housed in a steel building on the east bank. Engines are connected directly to Elliott ac generators rated at 1250 kva, 4160-400 volts. Engines are equipped with Young engine jacket coolers, Cycoil air filters. Power control panels are General Electric. Western owns portable diesel-electric generator sets which can also supply these large shovels. Other loading equipment includes a 151-M Marion dragline swinging an 8½ cu. yd. bucket, electric powered, and a model 4500 Manitowoc dragline, powered with 450 hp Cummins diesel and equipped with 8½ cu. yd. bucket.

It takes a powerful fleet to haul the output of this loading equipment. There are thirty 50 ton model LLD end-dump Euclid trucks, each powered with a pair of 300 hp NRTB-6-BI Cummins diesels, with Allison TC-5640 transmissions and Fram oil and fuel filters. There are twenty-five 25 ton bottom-dump Euclids with GM 6-71 diesels and eleven 30 ton end-dump Mack trucks with Mack diesels and Mack transmissions. Mack engines use American Bosch injectors, Vortox air cleaners and

Purolator fuel filters. Besides dump trucks, Western moves tremendous quantities with a fleet of twenty-five Euclid TS-24 twin-power scrapers equipped with GM 6-110 engines in front and GM 6-71 engines in rear and 11 single engine, GM 6-71, Euclid scrapers. To push-load these scrapers in shale almost as hard as slate, they use a fleet of TC-12 Euclid twin-crawler tractors. There are 25 of these units, each powered with a pair of 6-71 GM diesels, Allison torque converters, using Vortox air cleaners, Commercial fuel filters and equipped with Delco-Remy electric starters.

These are but the main items of the diesel power spread, except for the Euc-nic, built by Western and believed to be the world's largest truck with 200 ton, 80 cu. yd. capacity. Placed in service late this spring, the big truck is powered by a pair of NHRS-600, 375 hp Cummins diesels. These diesels drive the eight 18:00x33 in. tires on the two driving axles through two Allison TCG-604 torque converters and two Allison TG-607 transmissions. Driveshaft and differential are Euclid. There are eight driving wheels—a pair of duals on each side and a total of 18 tires. The truck was constructed partly in the Kansas City shops of Western and partly in the field shops of Oahe. Welded steel body was fabricated in California. Other diesel-powered units consist of portable, rubber mounted light towers equipped mostly with Caterpillar D311 generator sets, Caterpillar dozers, diesel powered utility trucks, diesel-powered pumps, welders, motor graders and compaction rollers.

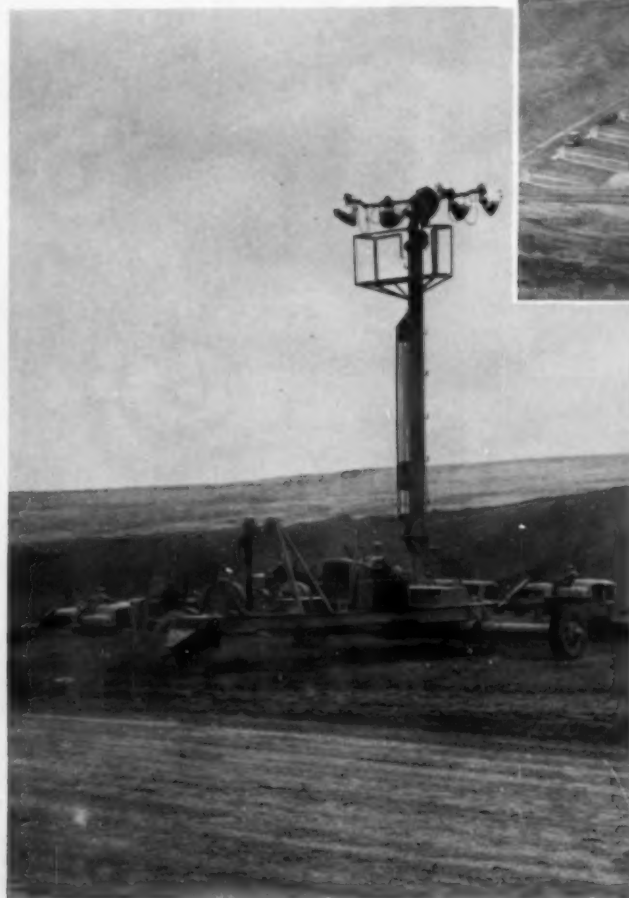
Key men on the job for Western are veteran dam builders, Carl "Rip" Collins, project manager, and A. "Blackie" Blackwell, general superintendent. Corps of Engineers is represented by John Sibert, Jr., area engineer and Lew Leavitt, resident engineer.



Euclid twin-power scrapers, TS-24's, being pushed loaded by two Euclid TC-12 twin-power crawler tractors in tandem. ➡

Completed portion of the spillway. Missouri river in far background. ➡

Western's shop-built portable lighting rigs have adjustable masts, Caterpillar diesel-electric generator sets. ➡

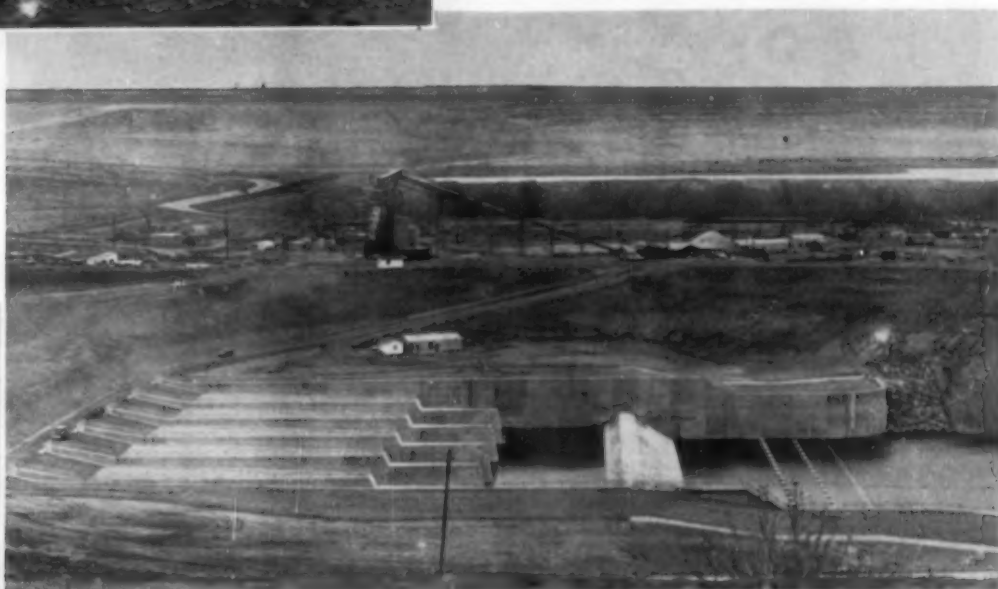


NOVEMBER 1958

29



A. "Blackie" Blackwell, general superintendent, and veteran of many Missouri Basin dams built by Western Contracting Corp. ➡



Believed to be the world's largest truck, the "Euc-nic" is powered by twin 375 hp Cummins diesels. The Marion dragline has a 450 hp Cummins. Present to see the units work are (left to right) H. H. Everist, Jr., Western Contracting Corp.; General G. E. Galloway; Colonel D. G. Hammon and John W. Sibert, Jr., area engineer, Corps of Engineers, U. S. Army. ➡

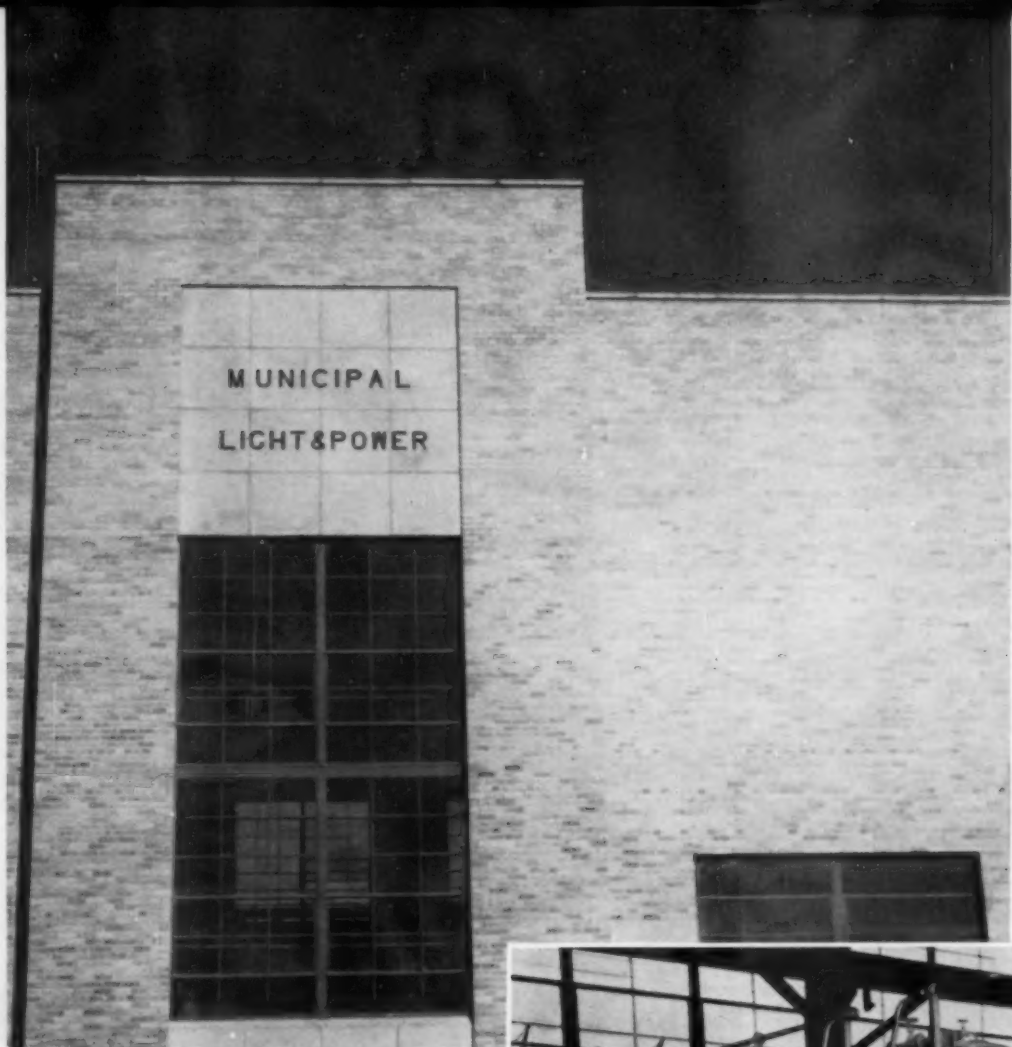


MORGAN CITY, LOUISIANA

**Municipal Plant With 7
Fairbanks-Morse Diesels
Took 17 Years To Net Its
First Million Dollars, Less
Than Five Years For Second;
Will Get Third In 1958**

MILLIONS in profits are coming faster at the Morgan City, Louisiana, municipal power plant. After its modest beginnings in 1933, it took nearly 17 years for the Fairbanks-Morse diesels to grind out the first million dollars in net income. But output, efficiency and profits grew and the second million was bagged in less than five years. Now, with seven F-M dual fuel engines totaling 14,690 horsepower, the plant will reach its third million some time in 1958, less than three years. It is only right that Morgan City should have a fabulous power plant for this is a fabulous city. An extraordinary combination of natural resources made the growth and prosperity of the region inevitable. Morgan City stands 29 miles inland from the Gulf of Mexico on the giant Atchafalaya River, reputedly the deepest river in the world. Not only does this mean deep-water transportation to the seas but an inexhaustible supply of water for industry.

Morgan City and smaller Berwick across the river are the gateway to the rich tidelands oil and gas fields where more than a thousand wells have been drilled in the past ten years. All the major oil companies and scores of independents have operations offices here and a great complex of equipment, supply and service facilities has grown up around them. The petrochemicals industry has discovered the riches of the region and built plants to utilize them. In addition to oil and gas, the Gulf offers oyster shell reefs, and 30 carloads of shell (99 per cent pure calcium carbonate) are shipped daily from Morgan City. A great sulphur mine is just 20 miles away. The bulk of Louisiana's 3-million-ton-a-year salt production is mined within 50 miles of the city. A center of carbon black production is just 17 miles away. Morgan City as a port and shipbuilding center has long been the headquarters for fleets of shrimp boats, making this the logical location for major seafood processors. Agriculture adds millions to the area's income with sugar cane, cattle and lumber. Trappers get substantial numbers of furs. Added to all this are the recreational assets of hunting and fishing. The result of these many natural blessings (with tidelands oil as the greatest impetus) has been rapid growth of population. Morgan City grew steadily from 6900 in 1940 to 9700 in 1950, then zoomed to an estimated 13,000 this year, with another 6,000 outside city limits but served by city utilities. Obviously, this entailed a



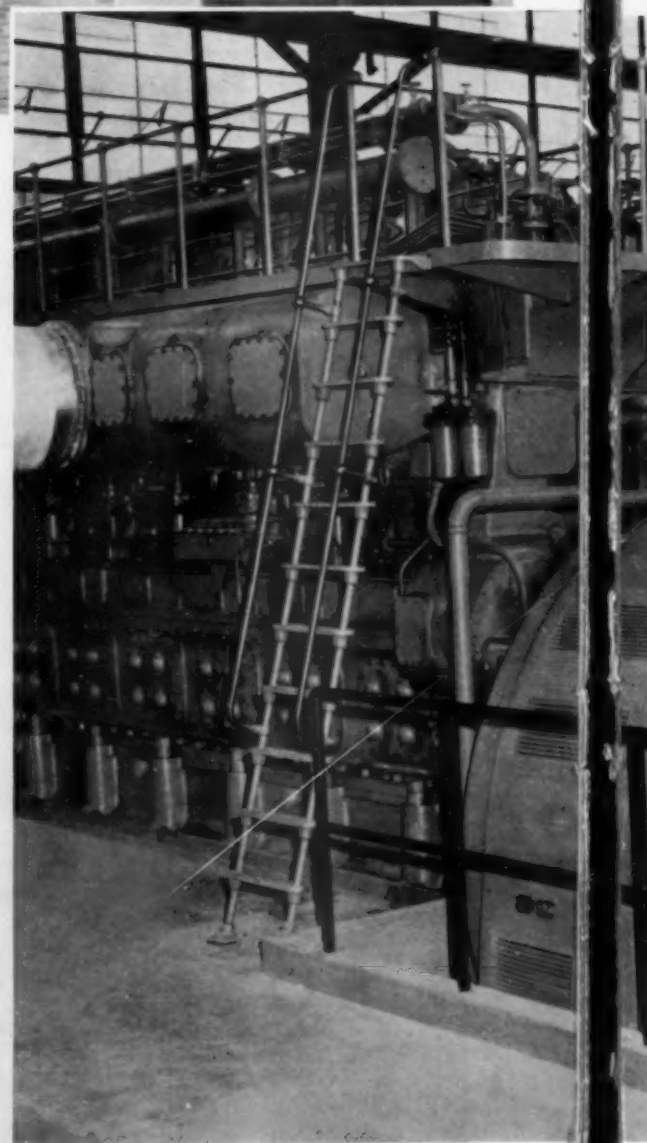
New section of the Morgan City plant constructed to house three 3500 hp dual fuel generating units, two of which have been installed to date.

Two biggest engines in the Morgan City plant are these 3500 hp Fairbanks-Morse dual fuel units, one installed in 1954, the other in 1957.

substantial increase in the demand for electricity and the municipal power plant expanded to meet the demand.

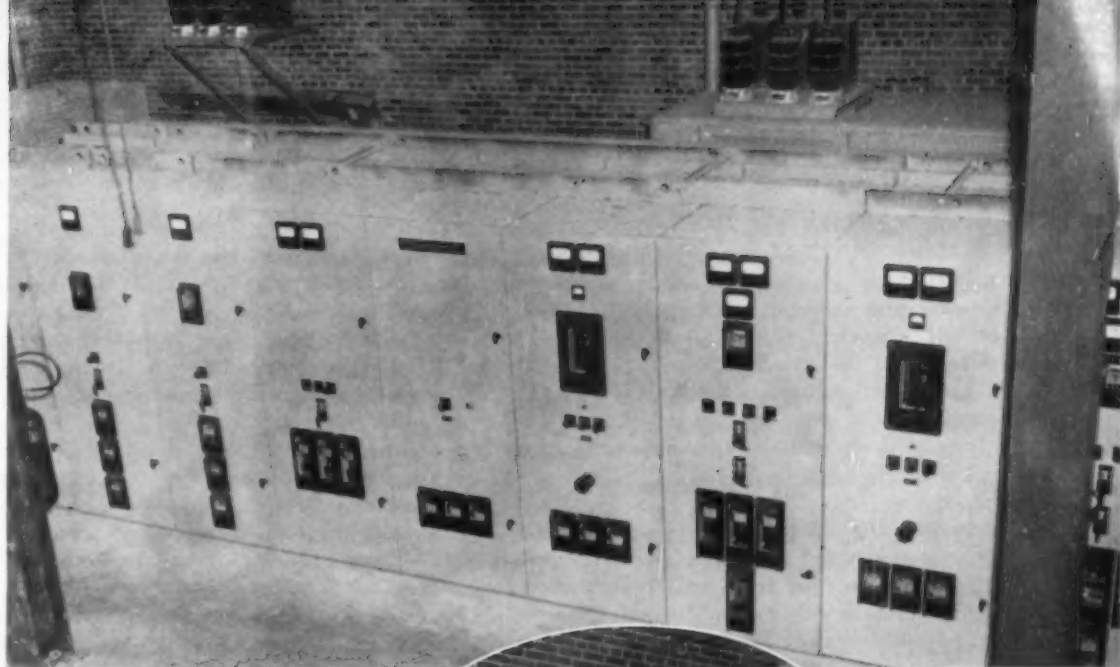
In 1933, the entire load was carried by a pair of 630 hp Fairbanks-Morse diesels, which sufficed until 1940 when a 1050 hp F-M diesel was installed. At four-year intervals, a 1200 hp and then a 1600 hp F-M engine were added to the plant. In 1952 (one of the old 630 hp units was replaced by a compact Fairbanks-Morse opposed-piston diesel rated at 1920 hp. The next step was a big one—the erection of a new building and the installation in 1954 of a big 3500 hp model 31AD18 F-M dual fuel engine. Another 3500 hp unit was added in 1957. To bring the expansion program up to date, the second 630 hp unit was removed and another 1920 hp opposed-piston diesel was installed this summer. This brings plant capacity to 14,690 hp. All seven Fairbanks-Morse engines burn natural gas fuel with a small amount of diesel oil as a pilot fuel.

From the first, this has been a well-managed plant and a profitable operation. Rates have not been raised in spite of the general price and cost inflation and Morgan City consumers pay an average of 3.5 cents a kilowatt-hour. Yet, profits have increased steadily with the volume of production.



DIESEL PROGRESS

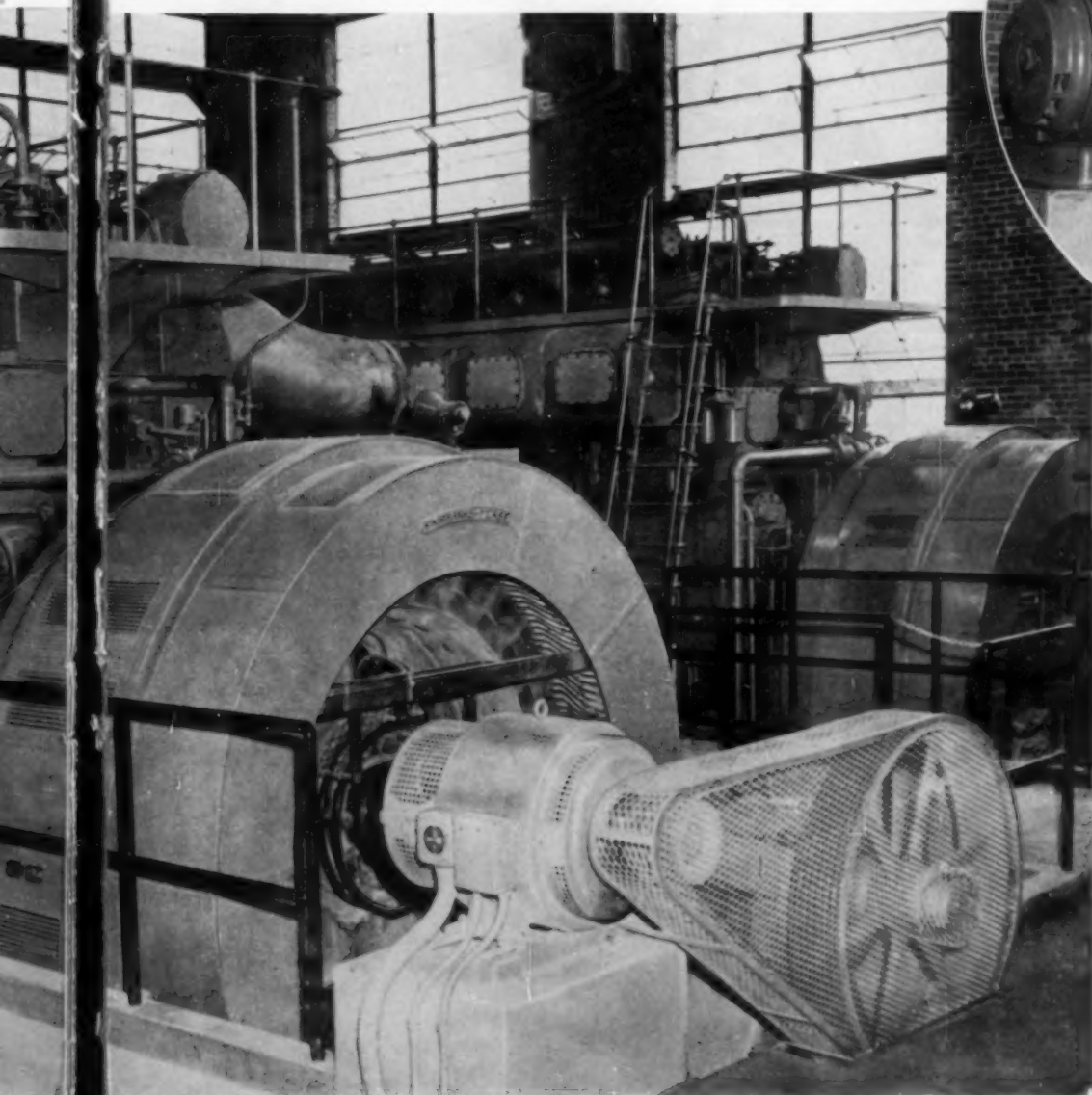
From 1934, first full year of operation, through 1950, the revenues of the department totaled \$2,267,240.96. The net earnings for the period were \$1,064,804.26, Morgan City's first million. Production and profits continued to accelerate in the next seven years, with gross sales of the Water and Light Department rising from \$396,836 in 1951 to a whopping \$835,403 in 1957. Similarly, net income rose from \$179,039.27 in 1951 to \$349,724.96 in 1957. The net for the years 1951 through 1955 was \$1,106,768.92, Morgan City's second million. By the close of 1957, the city had racked up \$838,026.73 of its third million and will easily pass that mark in 1958. The plant has been completely self-supporting, financing all expansion from revenues. In addition, it has paid a substantial portion of the operating expenses of city government through transfers to the general fund. These contributions too have been rising, going from \$87,000.00 in 1951 to \$150,130.85 in 1957. Total transfers for the seven years amounted to \$768,449.85. That is not the end of the story. The plant also provides each year free power for street lighting, sewage and drainage pumping, library, recreational centers and swimming pools, and plant personnel handle some maintenance work for city departments, power and services with an estimated annual volume of \$33,000. All of this serves to keep taxes low. Since 1951, the tax rate (based on about 20 percent of actual valuation) has come



The two 2500 kilowatt units generate at 13,200 volts and this high-voltage system is served by Westinghouse metal clad switchgear.



Scavenging air for the F-M engine installed in 1957 is supplied by this 24 in. Roots centrifugal blower driven by a 300 hp motor. In the foreground is the Roper pre-lube pump driven by a 10 hp motor.



down from 18½ mills to 16¼ mills. Without the contributions of the municipal utility, the tax rate for 1957 would have been more than doubled—actually 19 mills higher.

Basis for the success of the power plant has been sound operation of efficient and durable equipment. For the past seven years, fuel costs have averaged just 4.03 mills per kwh. Maintenance expense has been low, averaging 0.44 mills per kwh for the seven-year period. The efficient management of the municipal enterprise is typical of the progressive Brownell administration headed by Dr. Russell Brownell, Mayor, and Councilmen H. S. Hover, M. David Kahn, P. H. Kenny, Dr. B. A. Mula and W. M. Rowan. City Manager and Engineer is Leonard H. Roes and Plant Superintendent is Joseph J. Cefalu. City Clerk is R. M. Williams. Kilowatt-hour sales keep rising, from 11,211,900 in 1951 to 23,490,000 in 1957. Peak load on the plant reaches 6,000 kw in 1957 and is expected to hit 6,600 kw this year.

LOCOMOTIVE UPGRADING PAYS DIVIDENDS

AMERICAN railroads are upgrading their motive fleets by turning in old diesel locomotives for new ones with a substantial saving in capital investment. This was vividly in evidence in LaGrange, Ill. recently when the Chicago and Eastern Illinois Railroad took delivery of a "new" passenger unit, the 1,000th to go through the Electro-Motive locomotive upgrading process at the LaGrange plant.

According to N. C. Dezendorf, vice president of General Motors and general manager at Electro-Motive Division, "the first round of dieselization of U.S. railroads will be completed within two or three years and many diesel locomotives are beginning to reach the age where their obsolescence from the standpoint of performance and their cost of maintenance raise the question of their retirement. Electro-Motive has been producing diesels in important quantities since 1942, when it first got into real production of freight locomotives. The thousand locomotives to go through the upgrading process have been handled over the past

tured and incorporated into the latest model locomotives of their same type, or the type can be changed, with significant savings. For instance, many railroads are turning in their oldest 1350 hp FT freight locomotives for new 1750 hp GP9 General Purpose locomotives containing certain remanufactured components.

Old locomotives are completely torn down at the LaGrange plant of Electro-Motive. All components are inspected—with the same machinery and methods used in new locomotive inspection—to determine what is economically susceptible of upgrading to go back into a "new" locomotive. Certain components which can be remanufactured are then dispatched to the various production departments (engine to the engine line, generator to the generator department, traction motor to the traction motor line, truck to the truck line, and so on). While this remanufacture is going on a new underframe and body are being constructed in the new locomotive erection department. When the underframe and body are ready the upgraded

The "Eliza Doolittle" nears completion in this trucking operation at EMD's LaGrange plant.

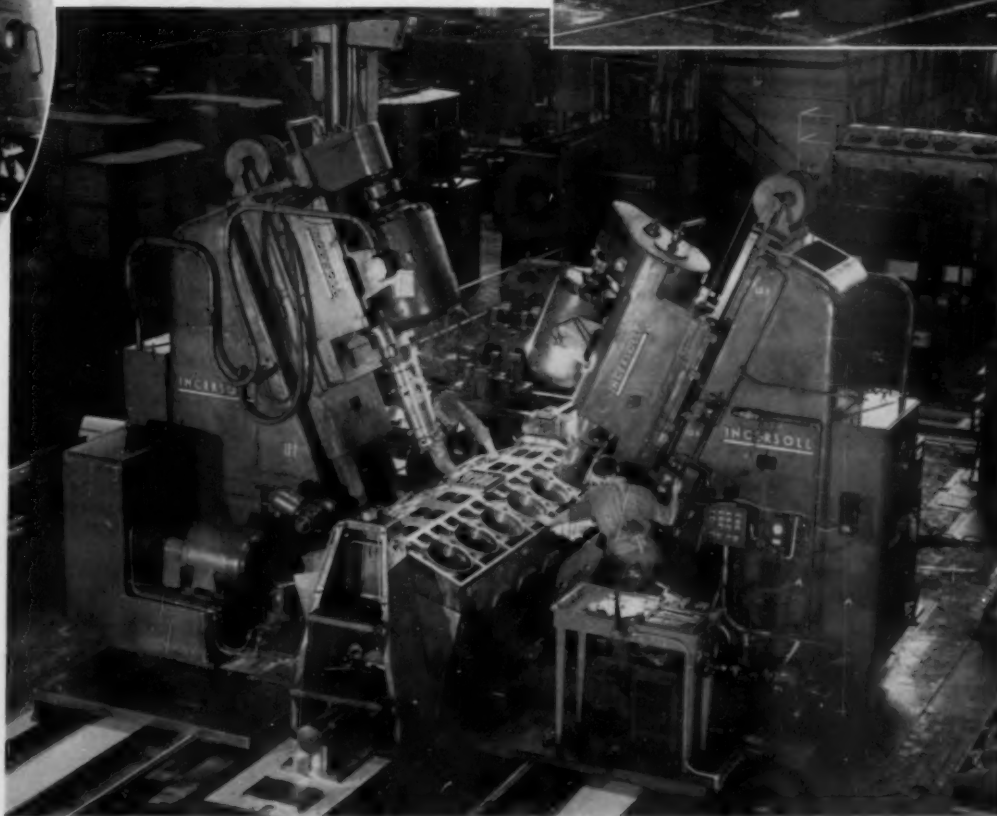
Twelve year old 2000 hp GM diesel passenger unit that had run 1,600,000 miles in high speed service on the C&EI railroad was the 1000th unit to be upgraded.

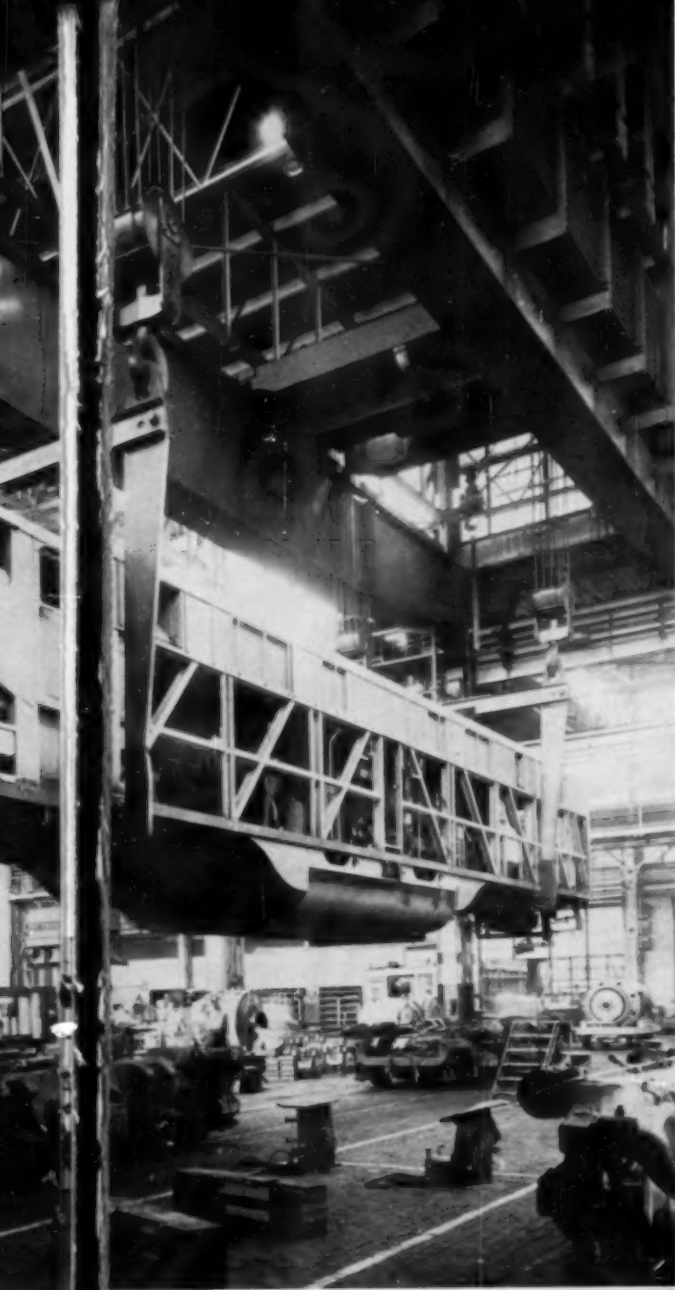
Operators using large vertical boring mills, mill cylinders on both sides of V-type crankcase of Diesel engine at the LaGrange plant of Electro-Motive Division of General Motors.



ten years. The number of locomotives reaching the age of retirement has been going up each year, as is indicated by the fact that Electro-Motive's upgrading business has increased at the steady rate of 33 per cent per year for the last three years. We are now turning out locomotives in this category at the average rate of about one a working day."

Upgrading is a standardized, mass production method of reclaiming old diesel locomotive fleets in such a manner that they are built up to the equivalent of new units of the very latest design at substantially less cost than the price of new replacement locomotives. Under the technique, components from old diesels can be remanufac-





engine, generators, traction motors, plus the new parts and assemblies, flow to the main erection room and are incorporated into the "new" locomotive, once again going right down the line alongside completely new locomotives. The body is dropped onto the underframe and welded in place. The whole is dropped onto the upgraded trucks and run over to the test building where the locomotive undergoes the same exhaustive testing with the elaborate machinery Electro-Motive has devised for completely new locomotive production. The unit goes through the same paint shop as a new locomotive and is then ready for the railroad.

Christened the "Eliza Doolittle," the new C and EI passenger unit will now begin doing its daily chores at the head of fast passenger trains across Illinois and Indiana. The old locomotive came into the Electro-Motive plant a 2000-horsepower scratched and scarred veteran of twelve years

service with 1,664,000 high speed miles behind it. The new one went out today ready for a whole new span of life with 2400-horsepower, which means it can haul more cars at the same speed or the same number of cars faster at less maintenance expense. This unit, containing certain remanufactured components from the old one, cost the railroad \$110,000 less than a completely new E9. It has the latest design improvements and a 100,000-mile new locomotive warranty. It will also do 20 per cent more work than their old one.

Another major railroad to participate in this program is The Minneapolis & St. Louis Railway Company which, within the past 18 months, has upgraded nine locomotives. Six were FTs manufactured in 1945 and three were F2s built in 1947. Horsepower on each was increased from 1,350 to 1,500 or in terms of ton capacity, from 5,800 to 4,500. Upgrading cost per unit was \$130,000 which



One of the nine locomotives upgraded for The Minneapolis & St. Louis Railroad. Horsepower was increased from 1,350 to 1,500.

Here is the sleek "new" 2400 hp unit that was christened "Eliza Doolittle" as a salute from one famous "upgraded lady" to another.



included a new body to make the locomotive serve multiple purpose: switching and road duty. According to W. W. Landmesser, M & StL superintendent of locomotive power, "The upgraded engines have performed well, enabling us to increase the flexibility of our fleet. Our road foremen of engines and our locomotive engineers have been well pleased."

The first thousand locomotives sent through the upgrading process represent an investment by the railroads of approximately \$100,000,000. Experience indicates that the railroads realize a return of about 20 per cent annually on this investment in savings in operating costs and increased locomotive capacity.

DEVELOPMENTS IN OUTBOARD PROPULSION

By GORDON MUNRO*

THROUGHOUT the development of ship propulsion, all vessels had one thing in common: they were steered by a rudder. In the sailing ship era, a ship could not be steered unless it was moving through the water; hence, the term "just steerage-way." The event of the steam engine and the screw propeller resulted in greatly improved maneuverability. The stream from the propeller acting on the rudder produces a turn-

ing both here in the United States and abroad.

and other restricted areas, it is customary to engage tugs to assist in turning or docking a ship, further evidence of the impotency of rudder steering, especially at low speeds. It is then that high maneuverability is most desirable.

A vast improvement in boat maneuverability came with the development of the outboard motor. For the first time, the propeller could be turned about

To apply the principal of the small outboard motor to larger units suitable for military and commercial service, it is necessary to cope with some basic differences. In the first place, it requires a large diameter propeller turning at low speeds to obtain the thrust needed to move heavy loads economically through the water. This, in



The *Percy C. Black*, Nova Scotia Highway Department ferry, is propelled by two model O-6C Harbor-masters each powered by a 187 hp Caterpillar diesel.

Here is the model O-7-2 Harbor-master which is driven by a 330 hp General Motors diesel. The small 20 hp model shown to the left has been discontinued.



ing effect even before the ship gathers headway. However, to this day, rudder steering is at best an inadequate means of maneuvering a propeller-driven ship. It depends upon deflecting at an angle the streams of water which flow aft relative to the ship, resulting in a force to move the stern of the ship over in the opposite direction. That this turning moment is relatively small is shown by the time required to turn a ship and by the large area of its turning circle. In harbors

*Naval Architect, Murray & Tregurtha Inc., Quincy, Mass.

its vertical axis, thus providing propeller thrust steering. This was an immense advance over rudder steering. It made use of the full thrust of the propeller stream in any direction, including reverse. It no longer was necessary to use a rudder. At last, a propeller-driven boat actually could be turned about in its own length. The conventional outboard motor turns a small propeller at high speeds. The small size and high speed of the wheel limits the use of this type of outboard motor to relatively small, light hulls. In this field, it has made impressive advances and is one of the major factors in the sensational growth of pleasure boat-

turn, results in high torque in the transmission of power to the propeller shaft. The reaction to this high torque has to be overcome in controlling the direction of the propeller thrust, unless some method is found to balance out the forces. Then, too, the life of a unit for commercial service must be immensely increased over that of the sporting type of outboard. Shafting, bearings, gears, and other parts must have great strength. Special oil and water seals present problems of design and procurement. The whole proposition can be more clearly visualized when it is stated that "Harbor-master" Heavy Duty Units weigh up to twenty

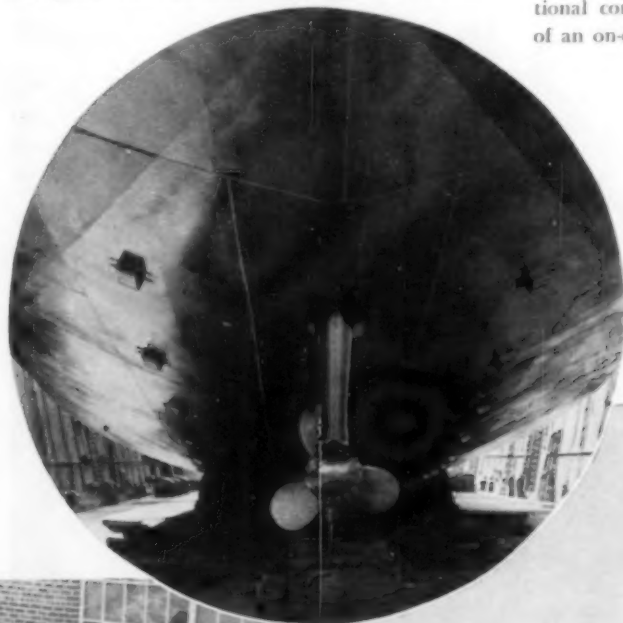
times as much per horsepower than do their small high-speed predecessors. Yet, this weight in many cases is far less than that of a complete inboard installation having equal engine and propeller characteristics and including rudder and steering gear. "Harbormasters" are capable of economically pushing enormous loads relative to their horsepower and weight.

Prior to World War II, there were no practical heavy-duty outboard marine drives on the market.

The necessity for landing men and materials on hostile shores gave impetus to the idea of especially-built landing barges. The U. S. Navy had been experimenting with a cellular type structure since 1935. This gradually was developed into the present standard Navy Lightered Pontoon. This unit is used in assemblies to form wharves, docks, piers, lighters, tugs, and various special-duty barges. It was most desirable that the craft made up of N. L. pontoons be self-propelled. The structural make-up of the N. L. pontoon barge, plus operational considerations, pointed to the desirability of an on-deck installation of the propulsion unit.

It became obvious that a jumbo outboard motor would best meet the requirements. The Bureau of Yards and Docks in 1939 extended an invitation to Murray & Tregurtha, Inc. to submit a design for a diesel engine driven outboard type propulsion unit suitable for use on N. L. pontoon gear. This invitation was accepted, the design was prepared and approved, and two trial units were produced. Subsequent orders made a total of 61 units that were manufactured by Murray & Tregurtha to this original design. Some of these units were still in use as recently as 1954. Experience with these units in service seemed to indicate that complete manual controls were advisable for combat use, rather than electric controls. Also, for quantity production, a gasoline engine could be more easily procured under prevailing conditions than the diesel engine.

Invitations were sent to four companies for the production of a prototype unit that would meet the revised specifications. Two of the companies did not produce a unit. Of the two units delivered and tested, one failed to meet the requirements



The Western Pacific Railroad car ferry, *Las Plumas*, below, employs a bow steerer Harbormaster, right, which is powered by a General Motors 220 hp, 6-110 diesel engine.



because it could not be steered manually. The unit produced by Murray & Tregurtha fulfilled all of the requirements and was approved and accepted. During 1940 and 1941, limited production contracts were placed with Murray & Tregurtha, and by 1943, this company was producing at its then maximum capacity of thirty units per week. This volume was not sufficient to meet World War II requirements. Four other companies were selected by the U. S. Government to boost production. These firms were licensed by Murray & Tregurtha, to use its designs on a royalty-free basis and were supplied with technical and engineering information without compensation. The N. L. pontoon barges and the Murray & Tregurtha propulsion units met a vital need

One of two model O-7 Harbormaster units used by the Standard Oil Co. of Ohio on the *Fleetwing* Tow for additional power and maneuverability.

throughout the war. They were of incalculable value in every major amphibious operation in both the European and Pacific theatres. After the Normandy landing, a top-ranking Naval Officer stated that 80% of the material landed during the first ten days in support of this invasion was carried ashore on Harbormaster propelled N. L. pontoon barges.

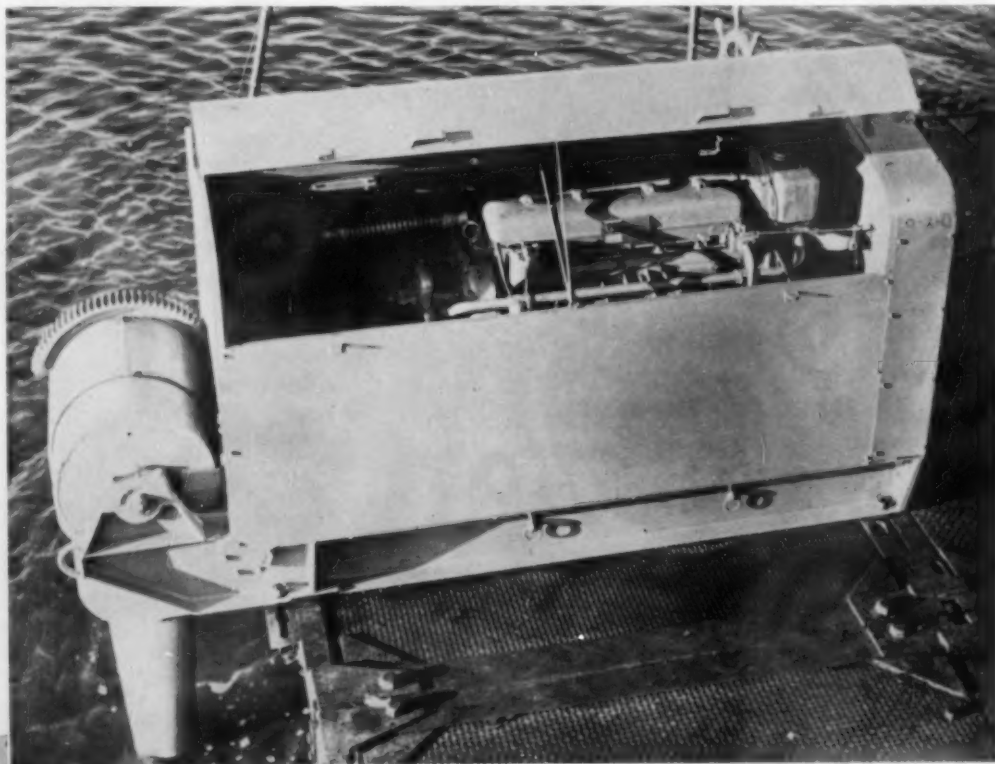
A feature that is of utmost importance in landing operations is the ability to steer with full propeller thrust in any direction. Landing through surf or breakers is a hazardous operation. With rudder-steered craft, it is most difficult to overcome the tendency to broach. The superb maneuverability available with Harbormaster balanced steering greatly decreases the danger encountered in landing on a beach. Of almost equal value is the ability to retract a barge from the beach with Harbormaster power. By turning the steering wheel to put the propeller in reverse position, the full power of the engine is available for going astern. Even though it may be hard aground at the bow, the wash from the propeller, oscillated from side to side, is able to free a barge that otherwise would remain fast ashore. The production of war-time Harbormasters was hampered by material shortages and controls which had a direct bearing on their design. Due to the urgency of the war emergency, it was decided to incorporate automotive components in the transmission, rather than special parts that were subject to procurement delays. It was recognized that this would result in a unit of short life for heavy marine propulsion, yet being classified as expendable emergency equipment, this was considered of secondary importance. As a matter of interest, a great many of these war time units, classified as surplus war material, have been used in commercial service in many parts of the world. Many of them are still at work, long beyond their designed life span.

After the war, the Harbormaster was redesigned to insure long life in heavy-duty commercial service. New models were added with improved features. Constant research and development has re-

sulted in a highly efficient unit with built-in ruggedness suitable for heavy marine use. Now manufactured in five basic models ranging from 40 hp to 400 hp, diesel driven Harbormasters can be supplied in single or multiple units for a wide variety of vessels. Engine and propeller characteristics and type of controls may be varied to suit individual requirements. Special units up to 1,000 hp are now under consideration. Murray & Tregurtha service records show some remarkable economies resulting from the use of their units, either as main or auxiliary power. Cargill, Inc. of Minneapolis use them on their grain carrying fleet *Cartasca*, *Caryuga*, *Caryutica*, and *Carpolis*, operating the year around on the Mississippi, Ohio, Tennessee, and Hudson Rivers and the Intercoastal Canal. Standard Oil Company of Ohio used two model O-7 units as additional power for

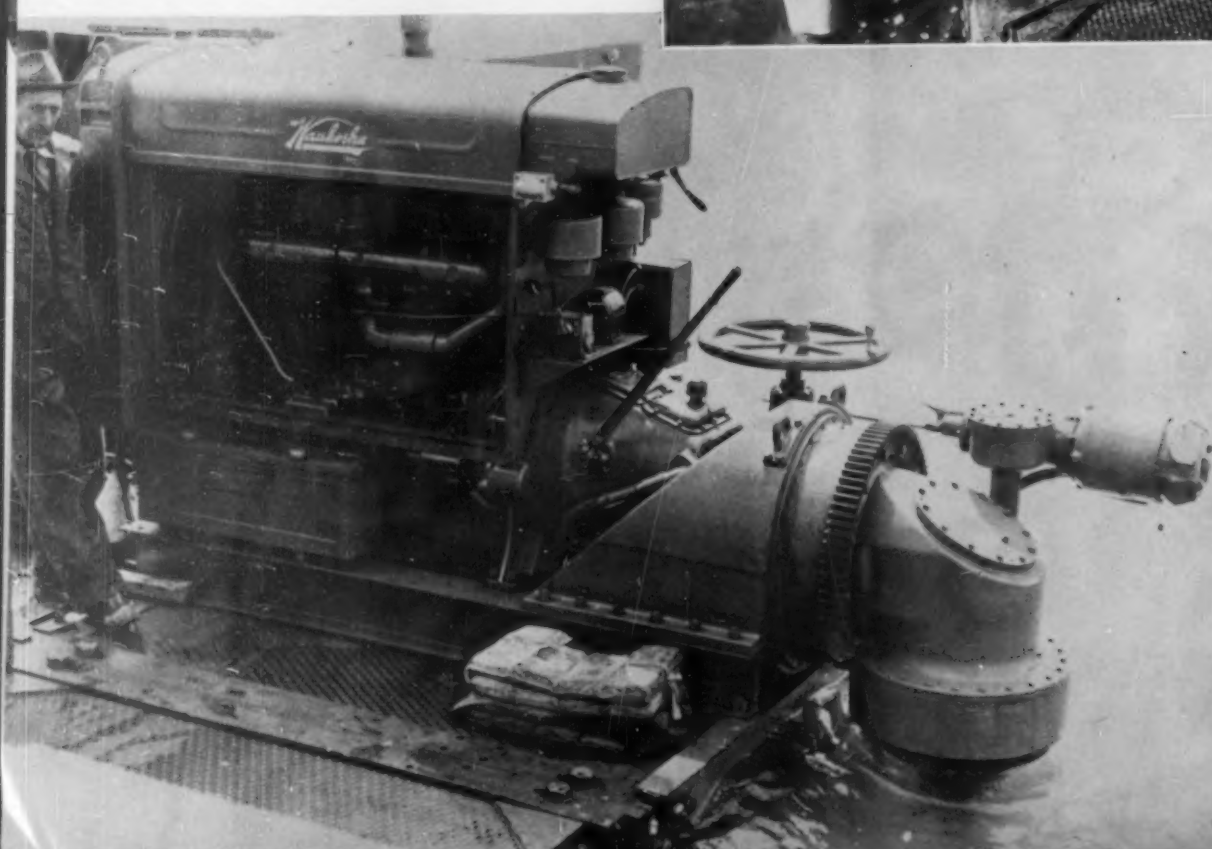
the *Fleetwing* tow mounted on the quarters of the barges just ahead of the towboat. This added from $\frac{3}{4}$ to $1\frac{1}{4}$ smph when pushing a 20,000 ton payload and paid for itself in less than one year. Harbormasters are used in the Tropics and in the Far North. At Point Barrow, our northernmost outpost in the Arctic, a year's supply of stores and materials are transported from ship to shore on barges propelled by Harbormasters during the very short time that this place is open to navigation.

The history of the development of the Harbormaster over the years should include the fact that it has been subjected to unusually severe tests by both Army and Navy engineers. That these units are accepted as standard equipment by both military branches speaks highly for their sound engineering and high-quality construction.



▲
The third model of the Harbormaster built during World War II was designated O-2D and rated 115 hp.

Original Harbormaster model O-B was rated 145 hp with power supplied by a Waukesha diesel engine.
▲



HERCULES TO MARKET JLO-WERKE DIESELS

CANTON, Ohio—Hercules Motors Corporation has acquired sole American distribution rights to the German-built "Jlo" (pronounced ee-lo) line of air-cooled diesel and gasoline industrial engines within the continental limits of the U.S., William L. Pringle, president, has announced. In an agreement signed with Jlo-Werke, G.m.b.H., West German subsidiary of Rockwell Manufacturing Company, Hercules will market Jlo engines in the U.S. as the "Jlo" series. The engines have broad application as a power source in fields such as industrial, agricultural and construction equipment. The new engines were shown for the first time in the U.S. at the Society of Automotive Engineers' National Farm Construction & Industrial Machinery Meeting in Milwaukee, Sept. 8-11.

Complete service and parts for the new diesels—and for Jlo air-cooled gasoline engines ranging from 1 to 33 horsepower—will be maintained through Hercules' network of 76 U.S. distributors. In addition, Hercules will make its full engineering facilities available to those interested in new applications of this type of power to various equipment. The Jlo diesel line, Pringle said, represents an especially valuable addition to the Hercules line for two major reasons: 1. Offered in two basic models, a 7 hp high-speed (2500 rpm) model and a 12 hp, 2000 rpm model, the new diesels complement Hercules' existing line of 35 to 70 hp air-cooled gasoline engines. 2. These new one cylinder diesels, featuring cast aluminum cylinder block, crankcase and piston, offer what is believed to be the lowest weight-per-brake-horsepower ratio of any air-cooled diesels in their size range: less than 16 lbs. Engines weigh, respectively 110 and 190 lbs.

Other outstanding features of the new line, as outlined by Pringle: simplicity in design obtained through use of two stroke cycle provided with air intake through the crankcase; a reverse-loop scavenging system insuring good performance and clean combustion even in the high-speed model; a Lanova combustion system, which increases engine efficiency by producing a flow of burning gases directed into the fuel spray in such a way as to insure optimum fuel and air mixture. This system works exceptionally well in two-cycle engines where valves are eliminated; exceptional back-up torque characteristics which provide excellent load-carrying characteristics at reduced speed; axial blower designed to insure cooling for all temperatures and load conditions; large selection of optional equipment, allowing engine specifications to be set up to suit any application, and an air cleaner and muffler provided as standard equipment. The lighter model, series Jlo-325, offers 2.75 in. bore, 3.35 in. stroke, 20 cu. in. piston displacement; it is 13 1/4 in. long, 14 in. wide and 14.7 in. high above the crankshaft. Series "Jlo-660" measuring 18 3/4 by 25 1/8 by 17 5/8 in.—has 3.55 in. bore, 4.1 in. stroke, and a 40 cu. in. piston displacement.

The Jlo diesels, according to Pringle, have proved particularly efficient in a broad range of applications throughout many parts of the world. They are widely used, for example, to power auxiliary generators, agricultural implements (where power requirements are below 15 hp), contractors' pumps and light construction equipment—such as asphalt batchers, spreaders, concrete saws and jointers, and pavers. In generator applications, they offer

the advantage of quick starts in any temperature—plus a torque characteristic that provides excellent constant-speed operation. In agricultural implements, the favorable back-up torque characteristic provides extra power for tough service. When used in construction equipment, they can be provided with special intake filtering arrangements for operation under the most severe conditions.

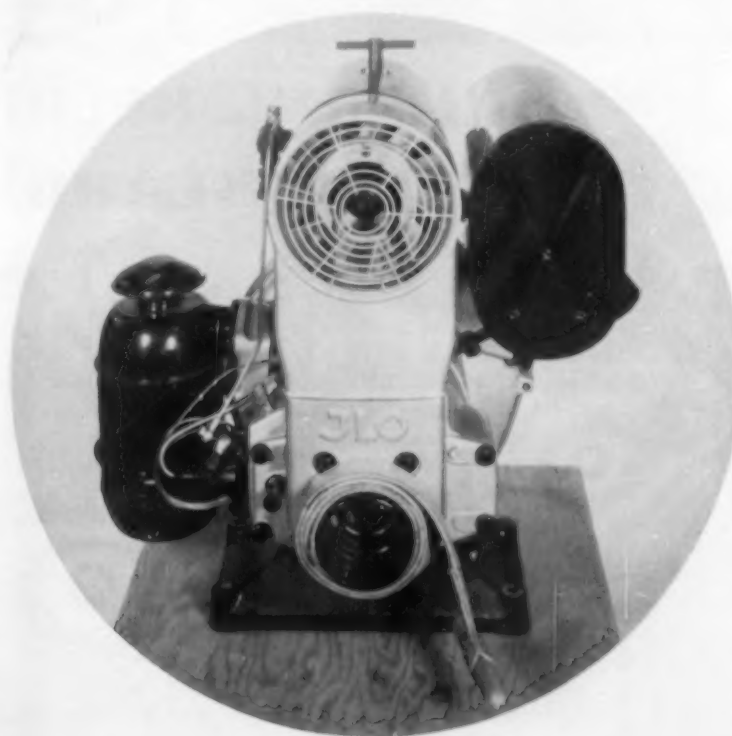
A system of ported intake through the crankcase, reverse loop scavenging and exhaust allows the elimination of all valves, tappets, push-rod and camshaft. This simplicity, plus the reduced flywheel mass required with the two-cycle operation, give the Jlo engines unusually light weight.

A new four-page bulletin on Jlo diesels, just issued by Hercules, describes their action as follows: Air is inducted through the crankcase. Combustion chamber is cleared of exhaust gases and charged with intake air at the end of power stroke by reverse scavenging using "Schnuerle" port design. Lanova combustion system used for clean operation. Axial blower, belt driven, provides cooling to match load and climatic requirements. The new bulletin also includes performance curves and lists 73 typical applications of the engines in industry and agriculture. Standard equipment furnished with the Jlo-325 includes air cleaner (dry type), governor, muffler (mounted on side of cylinder), flywheel for standard clutch, flywheel housing, starting crank, and lubricating oil pump. With the Jlo-660, air cleaner (oil bath), governor, muffler (mounted on side of cylinder), flywheel for standard clutch, flywheel housing, starting crank, lubricating oil pump, and fuel filter are standard.

Jlo-660 rated 12 hp max. at 2000 rpm.



Jlo-325 rated 7 hp max. at 2500 rpm.

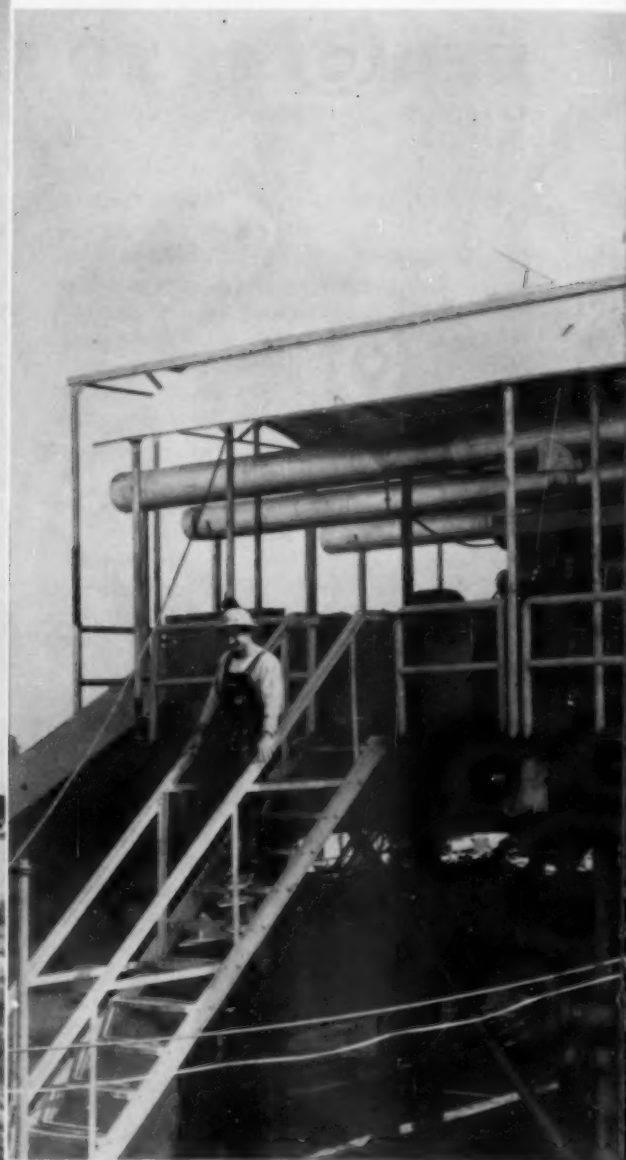




DRILLING RECORD SET IN OKLAHOMA

WHITE'S Superior drilling engines are helping to make new records as the oil industry pushes its explorations to new depths in Oklahoma. Powering a rig on one of these geological exploration wells in Western Oklahoma are three Superior 8G-825 natural gas engines of 700 hp each. Working on the No. 5 Rumberger test in the heart of the old Elk City field drilling has passed 22,611 ft. in depth, which makes it the third deepest hole ever drilled. If it reaches its projected depth of 24,000 it will be exceeded only by a west Texas wildcat that has reached a record 24,357 ft. Not only does No. 5 Rumberger stand the chance of becoming the deepest hole ever drilled, but according to the contractors it is the straightest hole ever drilled below 20,000 ft. The deviation from vertical at 20,000 ft. was 170 ft.

Oilmen today are commonly operating at 15,000 ft. to 20,000 ft. depths which were only talked about several years ago, and the "deep" wells are now reaching the 22,000 ft. to 25,000 ft. range. Each "deep hole" is a new laboratory for testing equipment and material, as the oil industry broadens its reserves to keep pace with consumption. Leaders among the oil industry have long predicted that much of the nation's future oil supply will come from tremendous depths and that exploratory programs will depend on the development of equipment capable of probing such depths. Shell Oil Company designed the Elk City experiment to test geological formations beneath the huge Anadarko Basin that long has produced oil from depths as great as 13,500 ft. The basin sprawls across western Oklahoma into the Texas

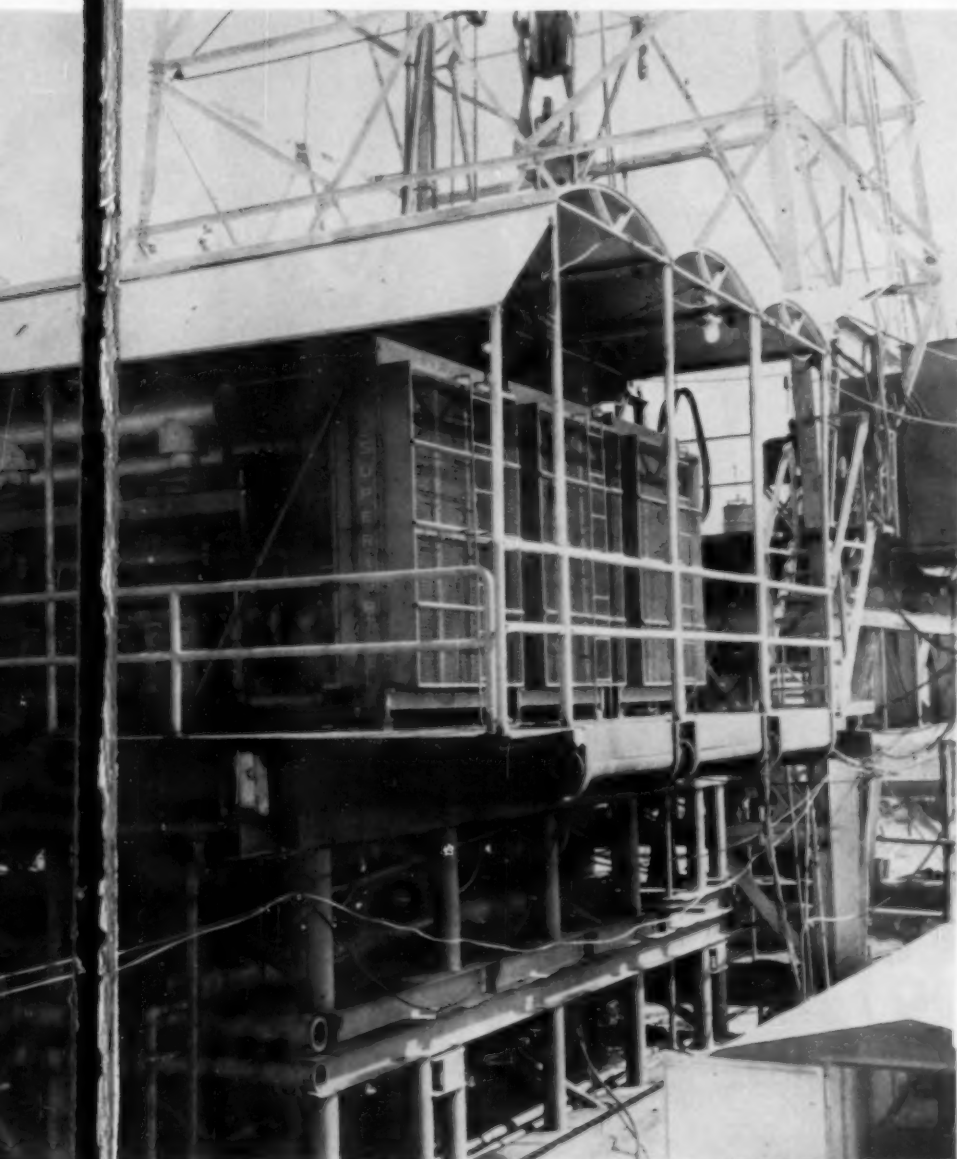


← Nearly 4½ miles of drilling pipe down the hole and this truck picks up more to place on the "ready rack" nearer the big Helmerich & Payne Company rig. A constant flow of special drilling mud is carried through the pipe on an 8½ mile round trip. It washes away rock cuttings from the drilling bit.

Panhandle, southeastern Colorado and southern Kansas. The initial objective was the Springer formation. When this failed to appear as expected at 17,500 ft., Shell increased the projected depth to 22,500. The sand appeared at 22,000 and the planned depth again was increased to 24,000.

Since Helmerich & Payne Drilling Company (Tulsa) started the drilling operation July 13, 1957 the Superior engines have not even had time to cool off. Servicing has been at a minimum because of the continuous work in the hole, but no repairs or stoppages have occurred. The engines were supplied with a rig and other equipment from U. S. Steel's Oil Well Supply Division.

Lacy Wall, the drilling crew boss, says the depth is not the only factor that makes Shell Oil Company's Elk City test the outstanding project of his 39-year career. "This has been the most trouble-free drilling job I have ever worked on," said Wall, who started working in the Burkburnett,



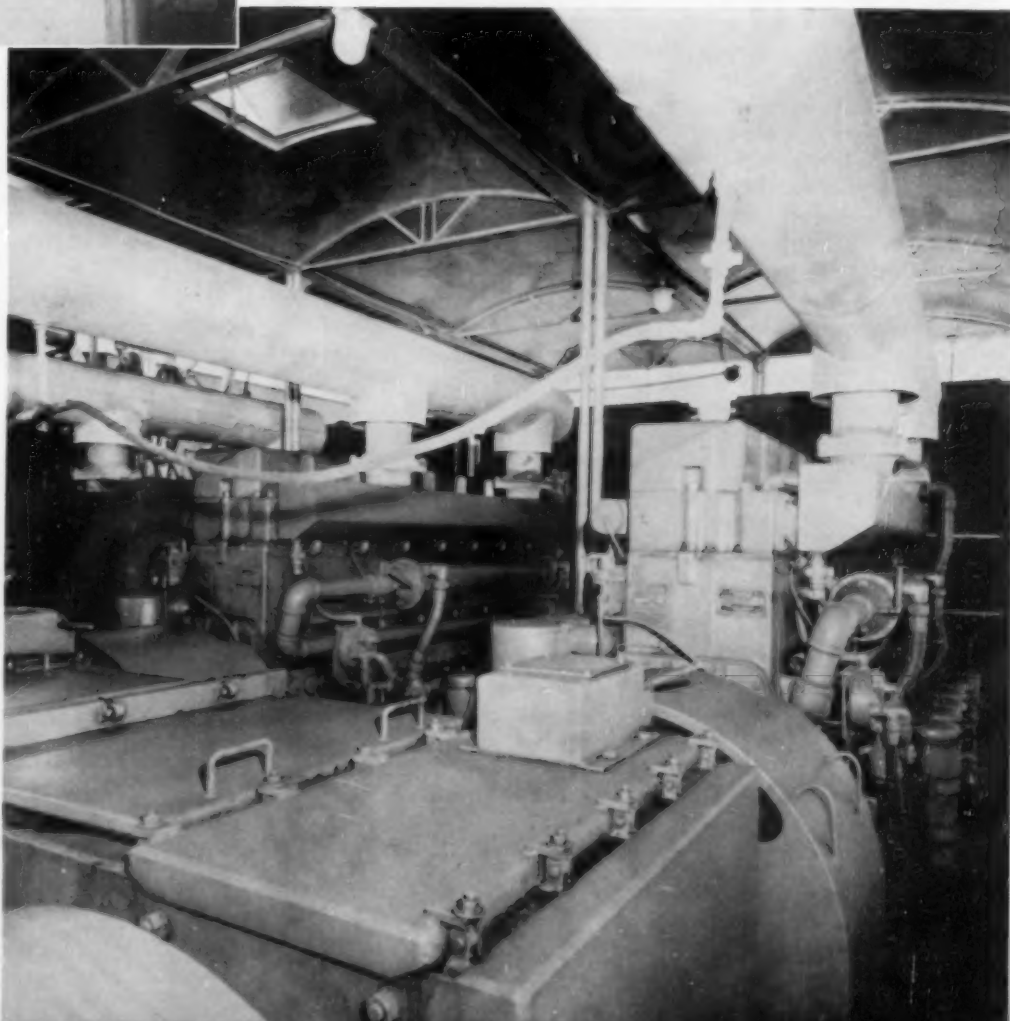
The Driller is the man who directs a crew of roughnecks and does business on the drilling floor of an oil rig. White's Superior engines are remotely controlled to provide power for his operations. His hand is on the brake, which releases the 300,000 pounds of drilling pipe suspended from the rotary table (right) like a giant auger.

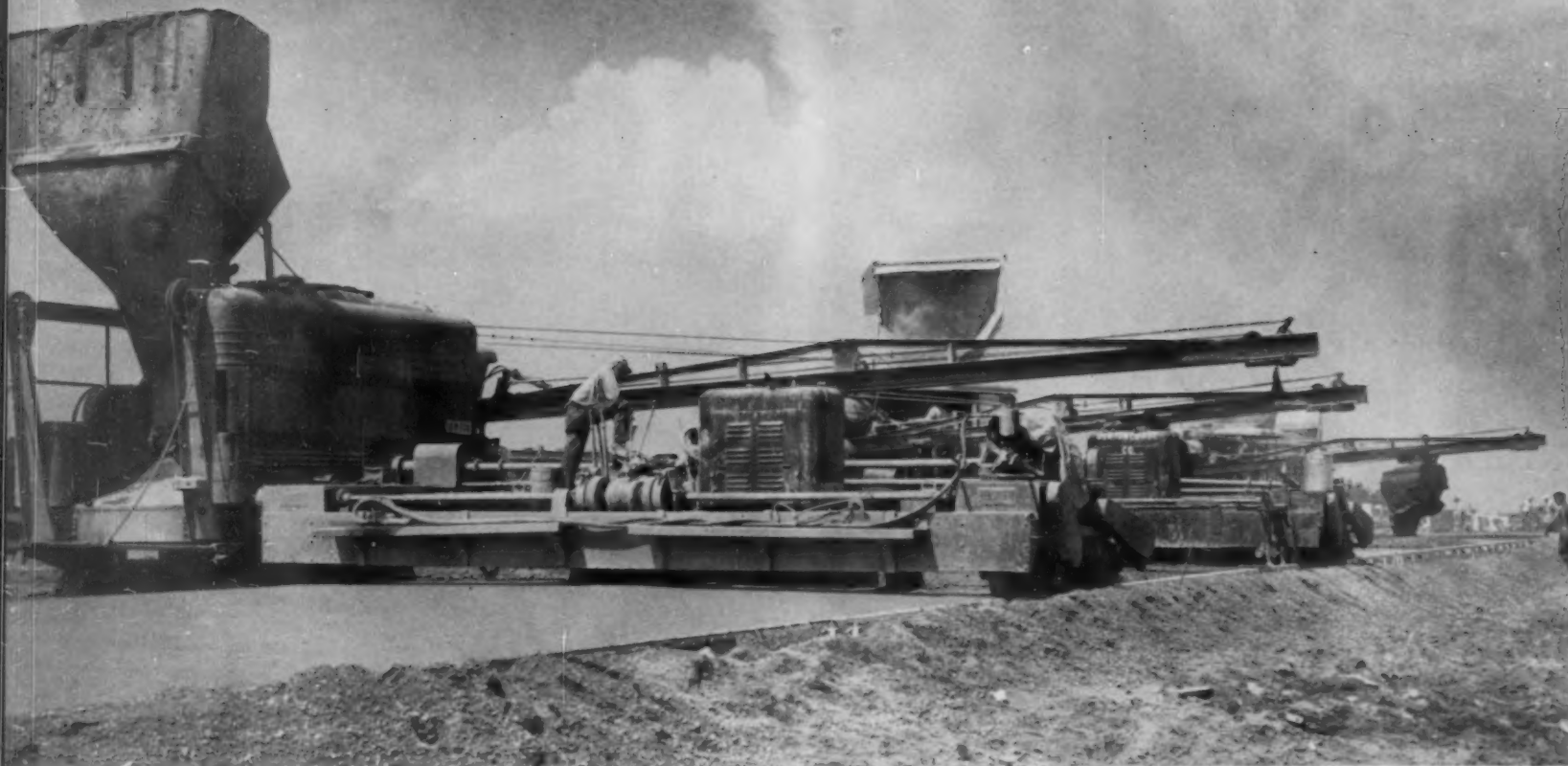
Top and right—Trouble free operation of these three Superior 8G-823 gas engines has helped to achieve the Oklahoma drilling depth record of more than 22,611 feet. These 700 hp engines were shipped in 1957 and have been operating since July 13, 1957, start of drilling at Shell Oil Company's lease south of Elk City, Oklahoma.

Texas field in 1919 at the age of 16.

Tremendous work loads are incurred in applying more than 2100 horsepower for hoisting a 300,000 lb. "string" of pipe and for pumping drilling mud on its 8½ mile round trip down the drill pipe and and back up the casing. The rig includes a derrick which can handle 1,000,000 lbs. of weight and stress, with its substructure "rated" at 1,400,000 lbs. The block in the crown of the derrick will handle 580 tons and the hook holding the drilling string, 450 tons. A hydraulic "cushion" feature is built into the shank of the hook enabling load shock to be cushioned when the Superior engines hoist the 150 ton load of drill pipe.

The Superior engines were produced in the Springfield, Ohio plant of White Diesel. They have eight cylinders of 10 in. bore and 10½ in. stroke and develop their rated horsepower at 900 rpm. They are compounded to supply 2100 actual horsepower to drawworks and mud pumps.





DIESEL EQUIPMENT HELPS SET NEW PAVING RECORD

By J. W. BROWN

TO anyone driving around the Detroit area and elsewhere in eastern and central Michigan during the last few months huge cement batching plants with a noticeable sign, Denton Construction Co., have become a kind of a landmark. A moving landmark to be sure, because this company has been very active on many of the new paving projects tied in with the \$2.5 billion road improvement program which has moved forward steadily in this state since announced about a year ago. With this same type of diesel-powered batching equipment feeding a continuous stream of the specified cement and aggregate to three Rex pavers, also powered by diesels, Denton Construction Co. set a new record for a single day's work last August, when they laid down 6,029 lineal ft. of 9 in. concrete pavement, 24 ft. wide in 12½ hr. The previous standing record for a comparable period was 5,787 ft. of similar paving laid in 12½ hr. was claimed by the Sargent Construction Co. of Saginaw, Mich. This feat had been accomplished late in July, 1958 near Battle Creek on the Detroit-Chicago expressway.

We had previously seen Denton equipment at work on a new and important clover-leaf interchange at Ford Road and Southfield on the City of Detroit-Dearborn line. In the September 1957 issue of *DIESEL PROGRESS* ("52 Pieces of Diesel Equipment") we reported Denton Construction's part in paving a stretch of U.S. 23 north of Ann Arbor, Mich. Since then we had heard of their exploits on a section of Utica Road, miles north of Detroit,

putting in a section of 4 lane concrete highway with integral curbing. For the job on which they made the paving record they were back on U. S. 23 south of Dundee, Mich., down towards the Ohio border. When the modernizing of U.S. 23 is completed, it will be an important thoroughfare. It is one of the main north-south routes which will connect the Ohio turnpike with such large Michigan cities as Ann Arbor, Flint, Saginaw and Bay City. It will intersect all of the main routes leading westward out of Detroit and thus become an important connecting link between Detroit and Chicago, Toledo and Kalamazoo, Toledo and Grand Rapids, etc. It will also bear increased traffic because of the new bridge over the Straits of Mackinaw.

Work on U.S. 23 is being done by sections. Except for "mopping up" operations Denton Construction Company recently wound up the 9-mile stretch south of Dundee. It was apparent that Denton has directed concerted effort in assembling the finest array of equipment possible for the U.S. 23 job and for others it hopes to undertake in the future. The equipment used on this paving job and with which they set the "world's record" pace consists of three Rex Pavers each powered by a 4-71 General Motors diesel engine, a new Butler portable batch-mixing plant powered by a 100 kw GM diesel generator set and 17 tandem-axle, 10 cubic yard trucks. And, of course, dozens of huge diesel truck-and-trailer combinations were used to keep aggregate fed to the batching plant.



Denton's batch-mixing plant on this job (as are the plants used on most of their jobs) was a Butler plant with several new features. It is of unitized construction for quick moving and setting up. The plant is completely pre-wired and has a central power-distributing panel which routes power from the 100 kw GM diesel generating set to all the components. There were four bins in use—4A and 10A aggregate, cement, and sand. Each bin has four batchers and the trucks were also equipped as four-batch units. Batching is completely automatic and interlocked so the batches cannot be discharged if they are incorrect. The GM diesel generator set has fuel tankage for 10 hours of full-production operation. The generator supplies



power for tripping air-cylinders on the bin's discharge chutes, for elevators and conveyors, etc.

The record-setting effort put forth by the Denton crew came about spontaneously and without any special planning. It was a Monday in mid August; the morning's work had progressed for about three hours before it became apparent to anyone that they just *might* make a new record. After that the men, under the experienced leadership of Superintendent Milton C. Palmer set to with gusto to see what could be achieved. The temperature was just right—around 70° and there was very little wind. Access roads and approaches leading to the pavers were in prime condition to provide good traction for the endless procession of material between the batch-mixing plant and the pavers. Such paving records are not made every day, but every day throughout the year that weather permits, wider, more level, new four-lane highways are gradually but surely creeping across our nation in all-directions, thanks to the day-in, day-out dependable performance of larger and better equipment powered by diesels.



The Denton Construction Company's new air-electric batch-mixing plant, pictured on location south of Dundee, Mich. Push button controls for automatically weighing and discharging road materials from bins are within reach of the truck driver from his cab seat. Power for all components including conveyor system is provided by a 100 kw General Motors diesel generator set, base mounted to facilitate moving.

Supt. Mickey Palmer, "boss man" on the Denton Construction Company's nine mile section of new U.S. 23 south of Dundee, Mich. The job constitutes Denton's second contract award on this extensive highway relocation project.



Top left—Here can be seen the booms of all three of Denton's Rex pavers which together laid 6029 lineal feet of 24 ft. concrete highway in 12½ hr.

Center—An extremely busy man—the operator of one of the Rex pavers spreading a batch of freshly-mixed concrete.

Right—Stretching away into the distance beyond the finishers is part of the nine-mile stretch of 4-lane concrete highway on the Denton contract.



MACHINERY DEALERS MEET MILITARY POWER DEMANDS

By H. C. RUGGLES and J. P. DONNELLY*

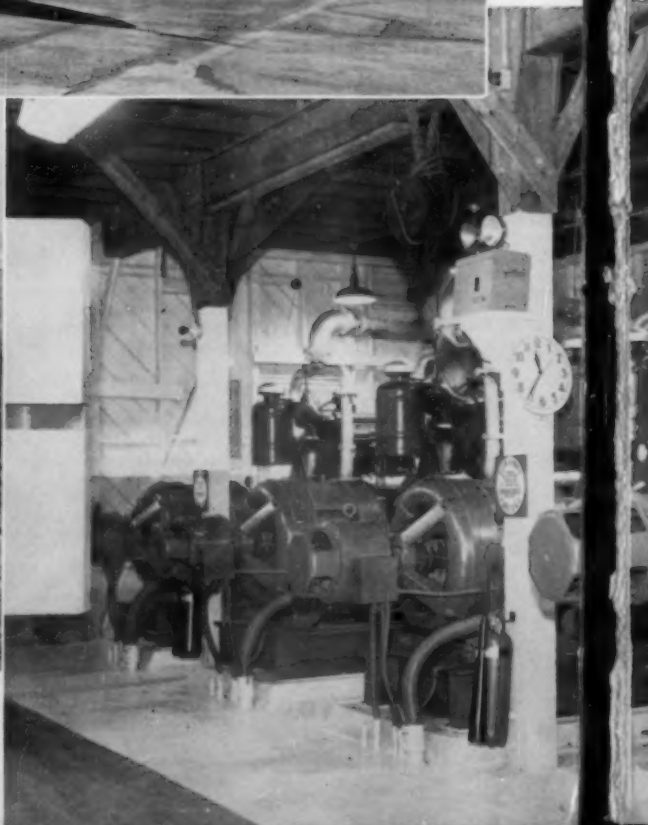
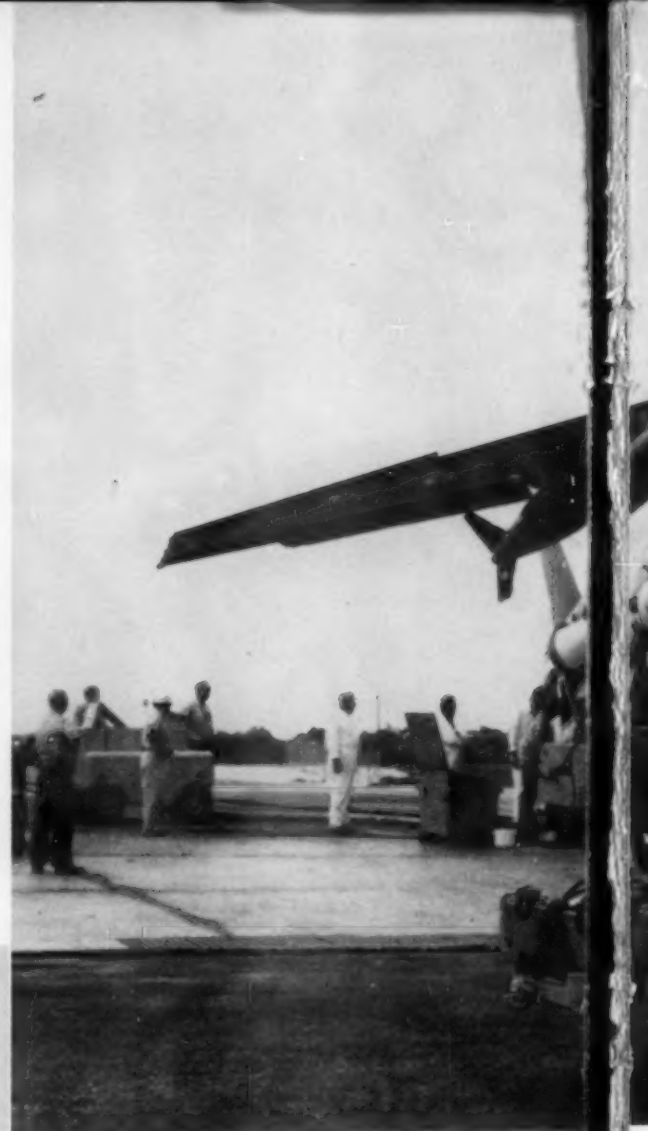
EXPANSION of our Military Construction Program is imminent as the cold war warms! Intercontinental missiles are increasing the concentration on "State Side" launching installations. Ultimately these missiles will eliminate our dependence on the countries of Europe, Africa and Asia for tactical installations. The expediency and success of this program may very well depend on the utilization of reliable local suppliers and their personnel to provide commercially available equipment adapted to military requirements. One such item is the diesel generator set.

The reliable equipment dealer provides assistance to his client at every stage of development including design, delivery, installation, testing, and operational service. Working on a local level, the diesel engine dealer can aid in all phases of a government power installation. In the early planning stages, work is done with the Corps of Engineers or other government agency and their consulting engineering firm. Here an extremely important function is filled; by supplying technical data covering equipment that is available as a standard manufacturer's product. To the consult-

ing engineer standard equipment is matched to the job requirements as nearly as possible to allow writing of specifications that will mean the best equipment at the lowest cost to the government. When a requirement does arise that cannot be met by available equipment, the consultant is aided with the detailed technical and cost data, and information on the availability of the specialized equipment from numerous sources. After the specifications have been finalized by the consulting engineers and the Corps of Engineers, bids are requested. Full details, covering the equipment, along with any deviations, are supplied to the contractor, who, in turn, transmits the proposal to the government. The power equipment quoted as a complete working package to meet the intentions of the specifications as well as the particulars involved. The dealer is equipped to do this more economically than a large specialized manufacturing company. Dealers purchase asso-

*Engine Manager and Engine Representative respectively of the H. O. Penn Machinery Company, Inc.

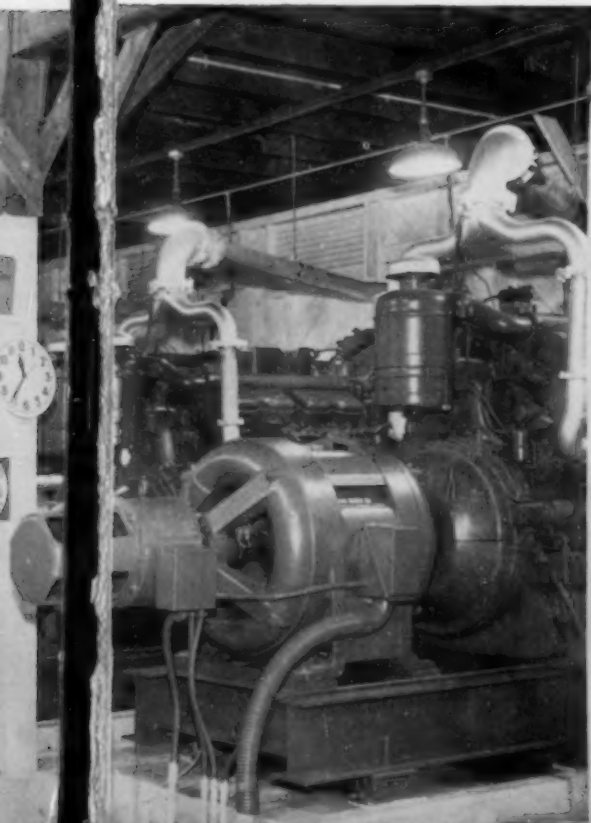
The Air Force Atlas ICBM is static fired to test its main and vernier engines at Convair-Astronautics' Sycamore Canyon facility located at Edwards Air Force Base Missile Test Center in California. Several Caterpillar D397 engines supply power to a reduction plant which produces liquid oxygen for the test firings. Caterpillar portable electric sets are also used as an independent ground electric power source for the Atlas.





▲ Caterpillar precise control portable electric set supports the Northrop Snark missile.

◀ Caterpillar Portable electric sets and stationary units in use at Trux Air Force Base, Wisconsin.



▲ The Martin Company, Orlando, Fla., a D337 diesel electric set was sold by the local dealer and serves as standby at this modern missile plant.

◀ Several Caterpillar diesel electric sets were installed at down range missile tracking stations in the Bahamas. Pictured are four which generate 68,000 kw-hrs per month and have recorded over 30,000 trouble free hours of operation.

ciated equipment to be used in conjunction with the diesel engine and subsequently assemble, fabricate and deliver the entire package to the job site.

Just as the Dewline provides the outer defense of America, so do the Bomarc missile stations provide its immediate defense. The announcement of the Bomarc stations was a giant step forward in the defense network of the United States. The Bomarc is a ground-to-air radar homing missile. The first of the Bomarc sites is at Suffolk Air Force Base, Westhampton, L. I. In the nerve center of the base, three Caterpillar model D342's, turbocharged diesel engines driving 100 kw, 60 cycle, 900 rpm generators for prime power purposes, are being installed. These engine-generator sets, were furnished by the H. O. Penn Machinery Co. Inc., the Caterpillar dealer in the New York area. By necessity, special electrical and mechanical characteristics were required. The generators required a transient voltage of 10 per cent maximum with a recovery time of .2 seconds, upon load acceptance and rejection. This requirement was met with the use of special generators. The switchgear, three generator panels in one cubicle, includes special automatic synchronizing equipment for the three generator sets. The dealer played an important role in the construction of this first Bomarc site by coordinating and assembling all of the equipment and delivering it in a minimum of time. This was an example of a deal-

er realizing the special requirements of a particular job and bring in a position to furnish the equipment efficiently, quickly and economically to the purchasing agency.

There are many other applications in which a dealer for a manufacturer of power equipment works closely with the military. Applications such as jet energizing units, Atomic Energy Commission

installations, ammunition storage depots, ramp and alert hangers, base hospitals, etc., all require diesel electric sets either for prime or standby power. The ramp and alert hangers are another integral part of our defense network. In the event of enemy attack it is necessary to get our fighters air-borne in a minimum of time. The Corps of Engineers has recently been installing diesel standby units to eliminate the possibility of an interruption in getting these aircraft air-borne. The ambient temperature in alert hangers is kept high to reduce the required starting time for jet aircraft. In order to heat these hangers they must be kept closed during cold and inclement weather, and a power failure could cause the aircraft, housed behind inoperative doors, to be grounded. Three of the first of these installations were supplied by our company. A Caterpillar model D397 naturally aspirated diesel electric set was installed at Suffolk Air Force Base, Westhampton, L. I. It has been equipped for completely automatic operation. A short deadline was set for the completion of this job. The dealer's representative worked closely with the Corps of Engineers and their consulting engineer in the planning and installation stages, and later completed the assembling and expediting of the equipment to meet the required early completion date. A second unit, a Caterpillar model D342 turbocharged, was installed at Otis

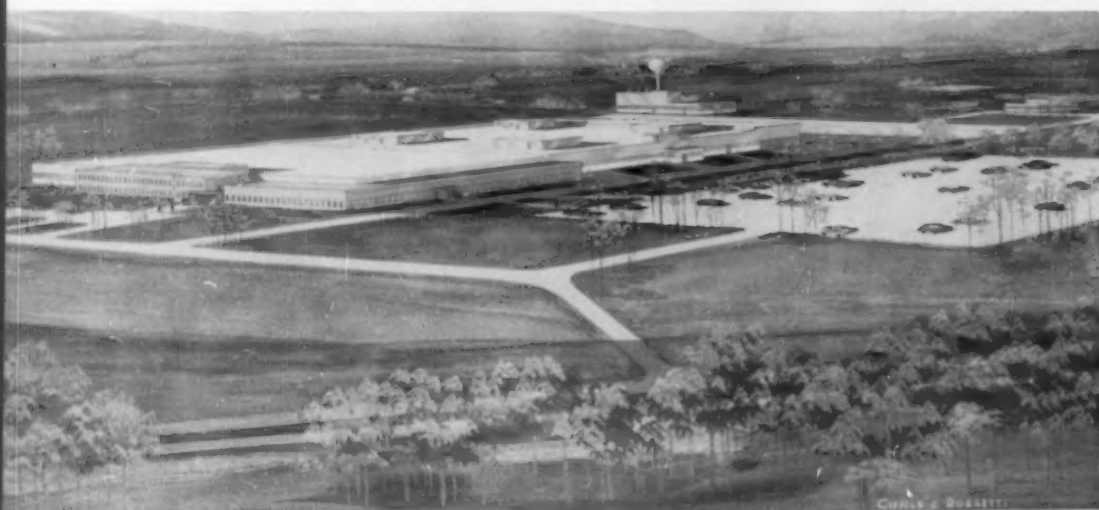
Meetings" which provide excellent operational and maintenance information. At these meetings, conducted by the dealers, governmental personnel are instructed by means of movies, slides, charts, etc., in the care and operation of the diesel equipment. Governmental installations are able to depend on these same dealership organizations for necessary parts and service. In this way the dealers provide reliable insurance for the heavy duty power equipment they merchandise.

Contractors, working on government jobs, are also receiving excellent service in obtaining the necessary equipment to do their job on time. Recently a large company, building government facilities in Goose Bay, Laborador, urgently needed a replacement engine for one of their Caterpillar model DW21 rubber-tired tractors. We supplied a diesel engine from stock and it was flown to the job site. In a matter of hours the earth moving tractor was back on the job. Another contractor received a contract to rebuild an extension to the Dewline in Greenland. The contract was awarded in June and because of the harsh weather conditions work would have to stop around mid-October. It was imperative that work begin as soon as possible. Here again the Penn Co. shipped two Caterpillar model D353 diesel power units for the crushing plant. These units were shipped immediately and

the crushing plant was ready for operation when the working crew arrived by ship in July. We also furnished 17 engine-generator sets to this job.

Prior to this year the hospital at First Army Headquarters, Fort Jay, Governors Island, N.Y.C., was without an emergency generator. Working with the Post Engineer, we made a survey of the hospital and established the requirements. The material was supplied by our company and, in turn, installed by the contractor. Now a Caterpillar self-regulated constant voltage diesel electric set, 200 kw capacity, provides the base hospital vital insurance against power outages. This particular unit was not installed any too soon. While in the final stages of installation there was an electrical failure and the engine generator set took over the entire electrical load of the hospital. The Post Doctors, Post Engineers and local military authorities were thankful they had acted quickly and prudently.

Technical information, product data, literature files, and parts and service facilities for commercially available equipment have become valuable aids to local military establishments. Thus dealership organizations have become a strong and valuable link in this chain of military construction. The dealer, who is equipped to supply the military, is in an excellent position to serve the government by furnishing them with the best possible equipment in the least amount of time at the most economical prices. More and more personnel of the Corps of Engineers and their consultants are depending upon this service, which is available to them through reputable merchants.



Picture at left is an artist's conception of Caterpillar's new industrial engine plant under construction at Mossville, Ill. Production is scheduled to commence in 1959.

These Caterpillar portable electric sets going down the production line are destined for ground support at one of the country's missile sites.

Air Force Base and a third, a Caterpillar model D397 diesel electric set, was installed at Dover Air Force Base. Standard manufacturer's products were furnished for these installations with the D397 electric set being rated at 250 kw at 1200 rpm and the D342 turbocharged unit being rated at 150 kw at 1200 rpm. Utilization of the standard products proved to be a definite advantage in meeting the short delivery schedules.

After delivery of the equipment another important function is performed; assistance is given in supervising the installation of the power machinery and its related equipment. Upon completion of the tests, in accordance with the specifications, the using agency is provided with actual test data for the particular diesel power unit involved. Instruction of operating personnel is also necessary and an important function. The dealer, in conjunction with the manufacturer, provides various types of training methods. The Caterpillar Tractor Co., through its dealer organization, offers "Cat Care



DIESEL FLEET KEY TO EFFICIENT SERVICE

Spector Mid-States Operates Over 400 Pieces of Diesel Line Equipment in OTR Program; High Availability and Operating Economy Important Factors in Carrier's Growth and Success.

By ROBERT E. SCHULZ*

CHICAGO, Illinois—This is the story of Spector Mid-States, one of the leaders of the trucking industry and an alert, progressive, sales-minded organization that has taken advantage of modern equipment and maintenance procedures to hold the lid on operating costs and improve service to customers throughout the 48. This is not unique to Spector, but certainly dramatically evident as you tour their offices, docks and shops and learn the philosophy behind the company's growth to the fifth largest carrier in the United States. So customer-conscious is Spector that its slogan, "Customerized Freight Service" was conceived to continually keep this thought prominent in the minds of all members of the organization, as well as the industries it serves. Spector, which merged with Mid-States in 1957 following two years of planned consolidation, is now in its 26th year. Headquarters are here on the southwest side of Chicago and 27 terminals are strategically located in principal cities throughout the country. In this far-flung organization, Spector employs 3000 people. Currently the company is averaging 1500 loads a week over-the-road and the diesel equipment is covering an average of 1,050,000 miles in the same period. This is big business and company's efficient diesel fleet is well equipped to handle it, safely, dependably and on schedule.

Spector Mid-States is currently operating more than 450 pieces of diesel line equipment in its over-the-highway service. White, International, Mack and GMC tractors are all used with the first two manufacturers supplying the majority of the units, most of them COE sleepers. In the White and International tractors, Cummins engines, models NH 220, NHB 600 and JT-6-B, are used exclusively with Fuller R-96 and R-46 RoadRanger transmissions and Timken axles, 22,000 lbs. in the rear and 11,000 lbs. up front. Winslow model 8-937-C full-flow lube oil filters are installed on the Whites and 750-C Luberfiners on the Internationals. Both use Vortox oil-bath air cleaners. The Mack tractors employ the builder's model 673 Thermodyne diesels rated 170 hp at the standard 2150 rpm. Duplex transmissions and axles are also Mack. The GMC units all have 6-71 engines rated

205 hp with Fuller RR transmissions and Timken axles identical to the White and International tractors. Tires on all units are 10:00 x 20.

Keeping a fleet of this size in top operating condition is a job requiring sound organization and coordinated maintenance procedures. Assigned to this task at Spector is Charles A. Davidson. As Director of Fleet Maintenance, Davidson is in charge of both the over-the-road and city programs. Most complex, of course, is the OTR program. A, B and C inspections are scheduled as shown in the PM sheet illustrated. The A inspection requires 4 man-hours, the B, 8 and the C, 12-man-hours. While the sheet shown establishes the Cummins' program

in particular, the other diesels are maintained with a similar schedule. Company maintenance is performed, except in emergency, only here in the Chicago shops, or at the Clyde, Ohio and Bedford, Pa. terminals. While the majority of the units are serviced at these locations, the company also has contracted for guaranteed factory maintenance of 106 tractors at six terminal cities: Cleveland, Peoria, Milwaukee, Kansas City, St. Louis and Pittsburgh. Daily each terminal in the network files a trip report via teletype on each of its diesel tractors. These reports, plus those originating in Chicago, channel to the maintenance department where a running mileage record of each unit is compiled. As the mileage of each tractor reaches



Backing into the dock at Spector's Wolcott Street, Chicago terminal, this International COE tractor with Cummins diesel typifies the modern equipment being used by this large common carrier.

The preventive maintenance program as set up requires pre-trip inspection of the braking system from lines, valves, and diaphragm to brake lining. The "A" inspection (at 6,000 miles) of the units involves a brake adjustment and a thorough inspection of the braking system for air leak with pressure applied. This same inspection continues each 6,000 miles up to 40,000 miles, at which time the wheels are pulled and all brake lining, shoes and drums are inspected. These inspections are covered on all power equipment. The trailers are given a pre-trip inspection after being connected to the assigned power unit, at which time, all line valves and linings are checked. The trailers are given a major inspection yearly when all brake diaphragms are removed and replaced with new cups. The brake shoes are removed, anchor pin removed, checked for wear and replaced when necessary after being lubricated with an anti-rust lubricant. However, should the brake lining wear down to an unsafe condition before the major check is due, the lining is replaced. With this program of brake maintenance, equipment is given the maximum in the way of preventive maintenance which results in a safer accident-free operation for Spector Mid-States.

I was impressed with the orderly, well-kept shop here in Chicago. The large area is laid out for a smooth flow of work, the mechanics are experienced and the equipment leaves little to be desired. One of the unique parts of the inspection program is the Spectrographic analysis made of lubricating oil at the time of each oil change or every 8,000 miles. Spector is one of only a few companies in the trucking field using this electronic analysis, even though major railroads have employed it for sometime. Well coordinated and followed through, the preventive maintenance program is paying handsome dividends for Spector Mid-States. Witness the fact that the time between overhauls has been increased from 125,000 to 300,000 miles now. The scope and importance of the program is substantiated by employment figures. Spector, in this single phase of its operation, has a force of 226 people.

One of the fascinating points in the tour of this headquarters operation was the well conceived central dispatch facility. Operations out of all terminals including Chicago are scheduled here via four major teletype circuits. Once the power is assigned, a running record is continually posted on boards identified by terminal location or relay point. The cards give the current location of each tractor and trailer, its number, designation, drivers and load. This is a momentous job, again considering there are more than 450 tractors and three times that many trailers in the fleet.

Spector, of course, is noted for many new ideas and innovations in the trucking industry, but perhaps one of the most significant is its now universal Relay System. With this system, one driver moves a loaded trailer to a relay station eight hours ahead; a fresh driver and tractor moves the trailer to its next relay point; a third to its destination. Advantages are evident; not only does a load go all the way without stopping, but of equal importance, a driver is at his home station every other day. This system has substantially increased the morale of the crew of 800 over-the-road drivers and has been a tremendous asset in

Heading up this aggressive organization is W. "Stan" Stanhaus who became President in 1955. Then 38, he was a veteran of 15 years with Spector. Mr. Simon Fisher, who joined the company in 1936, is Chairman of the Board. Other officers of the company are Cecil Vernon, Executive V.P.; H. E. Baker, Senior V.P.; A. L. Anderson, V.P. Finance; J. W. Ferguson, V.P. Transportation; C. L. Lunt, V.P. Research and Development; V. J. Williams, V.P. Marketing; E. Latimer, V.P. Western Region and E. Minick, V.P. Eastern Region. Mr. Roger Gerling heads up the national sales program.



Senior Vice President H. E. Baker, right, presents Cecil Vernon, center, Executive Vice President, with his 25 year service pin. Looking on is W. Stanhaus, President of Spector Mid-States.

CUMMINS ENGINE P.M. CHECK SHEET

Mechanic's Name _____

Date _____

REMARKS _____

Unit No. _____

OPERATION _____

A CHECK EVERY 5,000 MILES

- RECORD OIL PRESSURE HIGHT AND TEMP
- INSPECT BELT TENSIONING
- CHECK WATER PUMP
- SLUSH PUMP, FUEL PUMP, INJECTOR AND VALVES
- ENGINE OIL & FUEL CAPTAINING
- SUPPLEMENTARY REMARKS
- ENGINE OIL, FUEL, WATER TIGHT

B CHECK EVERY 12,000 MILES

- REPEAT A CHECK
- TEMP OF EXHAUST GASES
- ENGINE OIL, FUEL & WATER BY AT LEAST 4 POINTS
- ENGINE OIL, FUEL & WATER TIGHT
- ENGINE OIL, FUEL & WATER TIGHT

B-1 CHECK EVERY 24,000 MILES

- REPEAT A & B CHECKS
- WATER & EXHAUST GASES TIGHTNESS AND RECORD
- ENGINE WATER PUMP & FUEL PUMP
- ENGINE FUEL PUMP
- ENGINE SLASH ENGINE
- ENGINE OIL & FUEL CAPTAINING
- ENGINE OIL, FUEL & WATER TIGHT
- ENGINE OIL, FUEL & WATER TIGHT

C CHECK EVERY 48,000 MILES

- REPEAT A, B & B-1 CHECKS
- ENGINE OIL, FUEL & WATER TIGHT
- ENGINE FUEL, WATER, INJECTOR
- ENGINE OIL, FUEL & WATER TIGHT
- ENGINE OIL, FUEL & WATER TIGHT
- ENGINE OIL, FUEL & WATER TIGHT

The neat, orderly condition of the

The neat, orderly condition of the maintenance shop at Chicago facilitates good work. White tractor is in the foreground, GMC on the rack and White and International units to the right are all undergoing PM inspection.

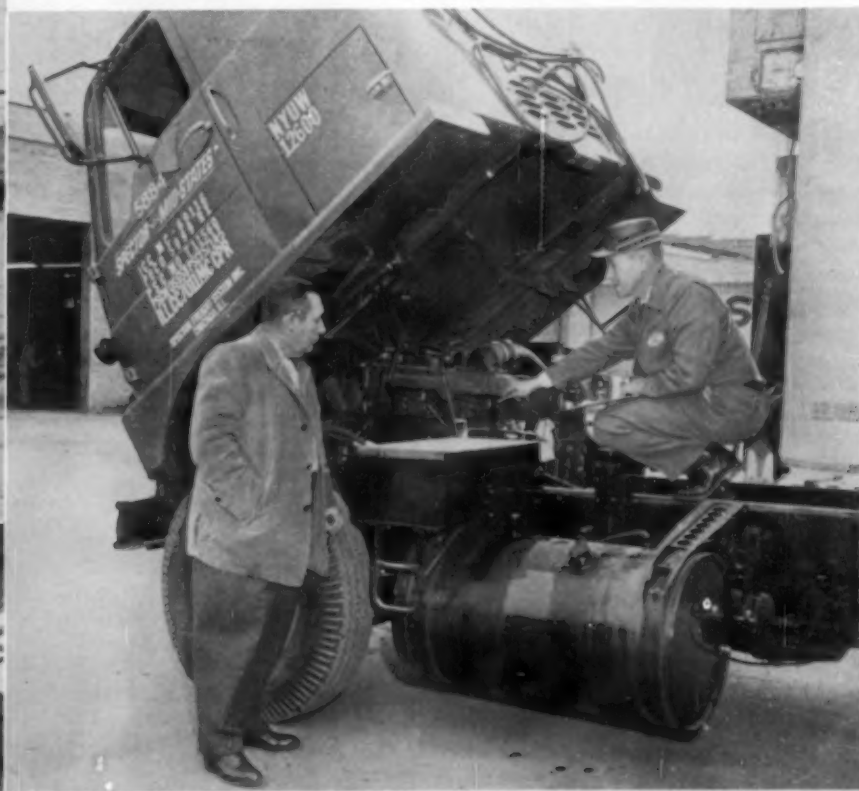
with offices in Chicago. With 25 years of growth and service "under its belt", Spector Mid-States today looks forward to even greater accomplishments under its Program For Progress. Diesels serving the Spector organization today are logging approximately 150,000 miles a year. Vice President Ferguson estimates that each tractor will have an economical life of 750,000 miles so it is easy to project many years of maximum efficiency and maximum utilization of the diesel equipment. This is important as the company moves ahead in the highly competitive transportation industry.

Here is one of the 125 Mack Thermodyne diesel powered tractors operated by Spector. ➡



➡ 32,000 lb. capacity Clark-Ross truck puts a container aboard one of Spector's White-Freightliners powered by a Cummins horizontal (pancake) NH-HB 600 diesel.

➡ Bob Kane, driver trainer, right, briefs OTR driver Talbert Beasley on the mechanical features of a new International tractor.



CARTHAGE, MISSOURI

RECOGNIZED as one of the outstanding municipal power plants in the nation, the Carthage Water & Electric plant, Carthage, Missouri, is a debt free, home-owned industry with a replacement value in excess of \$10,000,000. Annually, it supplies more than \$116,000 of free services to the city while maintaining lower prices for its product than its competitors. Ever since the first diesel engine was installed in 1921, plant operation has been profitable and a "pay as you go" policy was in effect for all improvements. Most recent of these improvements was the installation of a 5900 hp, 4200 kw diesel-generator unit in a new addition to the power plant building. The cost of the building extension, engine-generator unit, new switch-gear and associated equipment totalled more than one million dollars. These improvements were financed solely from power plant revenues at no cost to the taxpayers.

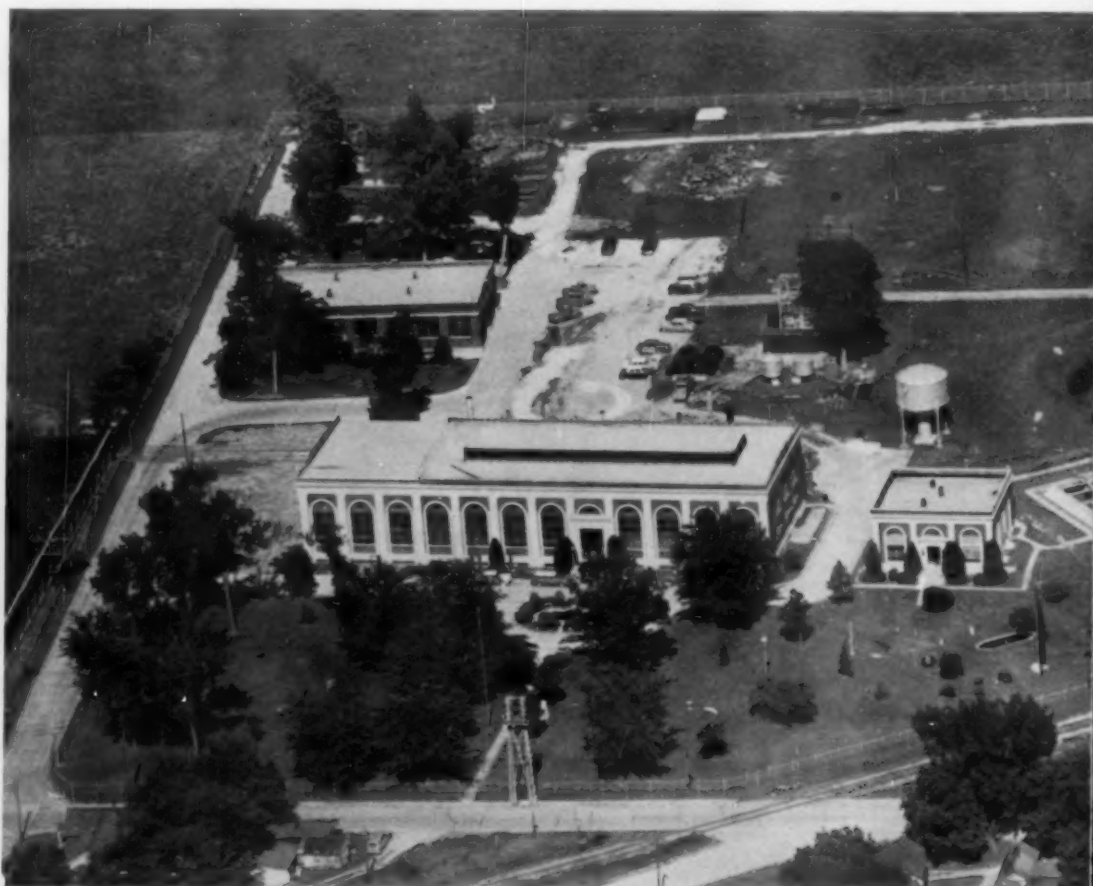
The history of municipal power in Carthage goes back to 1898. An initial \$25,000 bond issue was used for a plant building; boilers and two Corliss steam engines; and a distribution system. By 1920, a 300 kw Corliss engine-generator unit was carrying the load but fuel costs were such that the steam power plant actually sustained an operating loss. The Board of Public Works initiated a survey of existing conditions and future growth in load and decided to change from steam to diesel power. A three cylinder 750 hp Nordberg was the first engine placed in service. The fuel cost per kilowatt-hour for the diesel was \$0.008 as against \$0.021 for the steam equipment and a profit of more than \$48,000 was earned the first year the engine was in service. A five cylinder, 1250 hp Nordberg was added in 1923 and in 1929 both engines were moved to a new water and electric plant. The dark red brick building had been designed by Clarence Hoen, the general superintendent and built by local labor across the railroad tracks from the original building. Another 1250 hp Nordberg was installed in the new plant during its construction and it carried the load while the other engines were moved.

A considerable increase in industrial load by 1936 required the addition of more capacity. Another Nordberg engine was chosen but the advances in diesel design were very apparent as the six cylinder, 2250 hp engine was installed beside the other three two-cycle engines. The older engines were of 20¾ in. bore and 26 in. stroke, operated at 180 rpm, and had open crank case construction, water-cooled pistons, valve-in-head scavenging and gravity lubrication. The new engine had a 21 in. bore and 29 in. stroke, operated at 225 rpm, had a completely enclosed crank case, oil-cooled pistons, port scavenging and circulating pressure lubrication. This engine, like the older engines, was constructed with crossheads but was arranged for mechanical injection of the fuel. One of the outstanding features of this engine was its compactness of design. It was installed in the same amount of floor space that was required by the three cylinder engine, although it developed two-thirds more horsepower. In 1937, another 2250 hp engine was purchased to replace the original 750 hp unit. A duplicate of

the fourth engine, it was installed in the space and on the foundation of the 750 hp unit. The 750 hp engine, in service more than 16 years, was still serviceable but too small to be of any use.

Plant capacity met requirements for several years but World War II prevented needed expansion. When hostilities ceased, the Board placed an order for an eight cylinder Nordberg engine which was rated 3200 hp. This engine was installed in April 1946 and became the base load unit. The seventh Nordberg was added three years later. However, there was no space left in the power plant, so the oldest engine, #2, was retired. A nine cylinder, two-cycle Nordberg diesel, rated 3600 hp, was installed in the space formerly occupied by the 1250

tricity used per family increased rapidly, it became necessary to increase the plant capacity again in 1952. The last of the original units, Engine #3, was retired to make room for a new Nordberg 10 cylinder dual fuel unit. Each of the 1250 hp, six cylinder units had served dependably for 24 years. Now, each had been replaced by units with three to four times the horsepower. Engine #8 is rated 4300 hp, 3300 kw. With plant capacity at 15,600 hp, 11,800 kw, the plant had adequate protection. Peak loads in 1953 were 6200 kw and the Dualfuel units accounted for 99 percent of the production. However, demand continued to rise. In 1954 and 1955 peaks reached 7500 kw. The Board realized that considerable production capacity must be added to meet the constantly increas-



hp unit. Plant capacity was now at 12,550 hp. The larger, modern diesels were producing an average of 13.5 kwh/gal. of fuel oil. With a fuel cost of 8.5¢ a gal. in 1949, this amounted to \$.0062 per kwh. Back in 1937, the six cylinder diesels had produced 13.17 kwh/gal. but fuel and operating costs were such that the unit cost was only \$.0030 per kwh. As soon as natural gas became available, the Board authorized the changeover of the diesel engines to dual fuel operation. The three largest engines were converted for Dualfuel operation during 1950. Immediate economies resulted! On low pressure natural gas operation, fuel costs were reduced to less than \$.0024 per kwh. Total savings on fuel for the first full year of operation amounted to nearly \$90,000.

As the population grew and the amount of elec-

ing demand for electrical power. The capacity needed could not be concentrated in the present power house unless an addition was made. After carefully surveying the expected demand for power, a 49 ft. addition to the plant was authorized which would accommodate two 12 cylinder engines.

The municipal power plant's ninth Nordberg engine was installed in the new addition during 1957. It has twelve cylinders of 21½ in. bore and develops 5900 hp at 240 rpm. It is a Dualfuel unit and its Westinghouse generator has a net rating of 4200 kw. When engine-generator unit #9 was put on the line it became the base load unit. This single engine develops more power than the four original engines in the plant—and they occupied four-fifths of the original plant's floor space. Installed capacity of the municipal plant is now 21,500 hp, 16,

000 net kw. Peak load is now 8800 kw and the firm capacity of the plant is 11,800 kw, giving an adequate safety factor. All but one of the engines is capable of burning either natural gas or fuel oil and thus, maximum economy is assured. Recent operating figures show that the fuel cost per kw is \$.0031 and this should be further improved as the new Nordberg assumes the major production role in the plant.

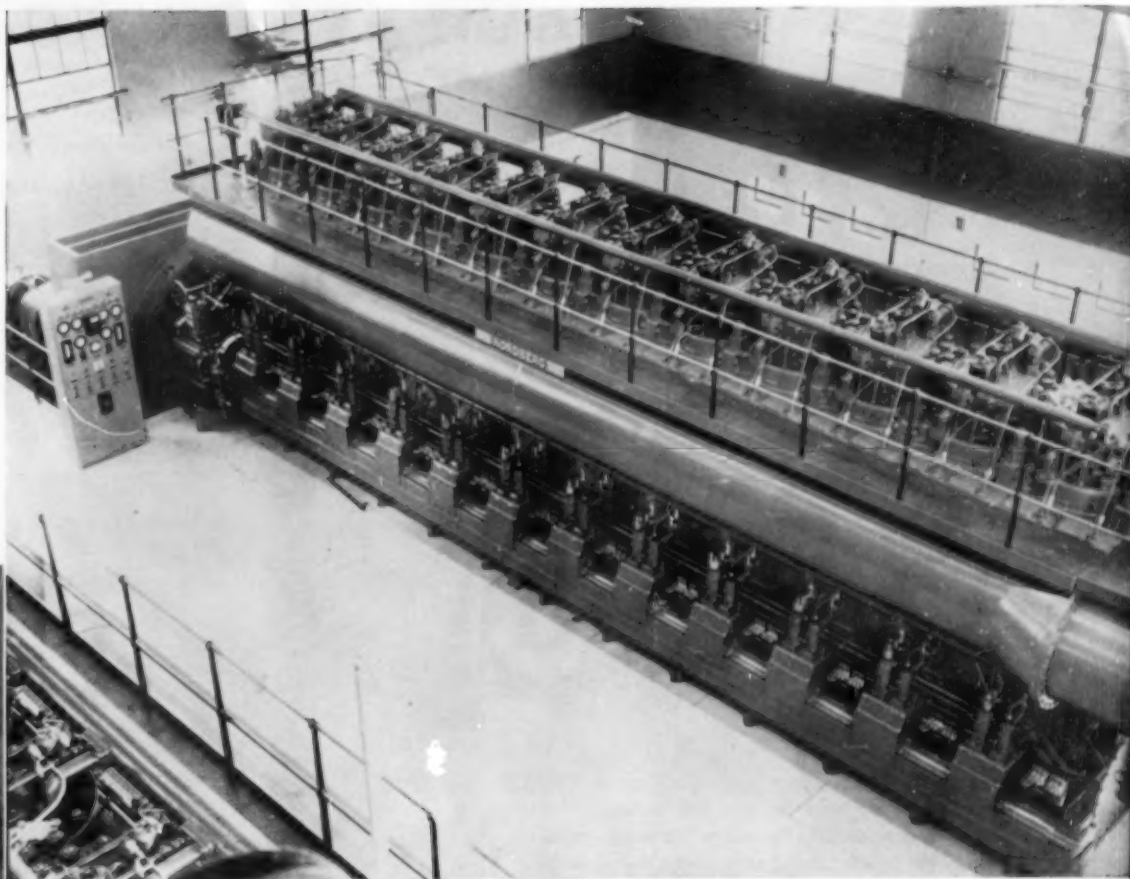
The Carthage municipal plant is considered one of the finest and most efficiently operated of its type and size in the country and due credit should be given to the Superintendents who formulated the early plans and carried them through. A. P. Knowles, Clarence Hoen, H. J. Williams and the present General Superintendent, Howard A. Berry have each contributed a great deal to the success of this municipal plant.



The Carthage Water and Electric plant presents a distinctive appearance with its circular drive, water fountain and neatly trimmed shrubbery. The new portion of the building includes the three arched window bays on the left.

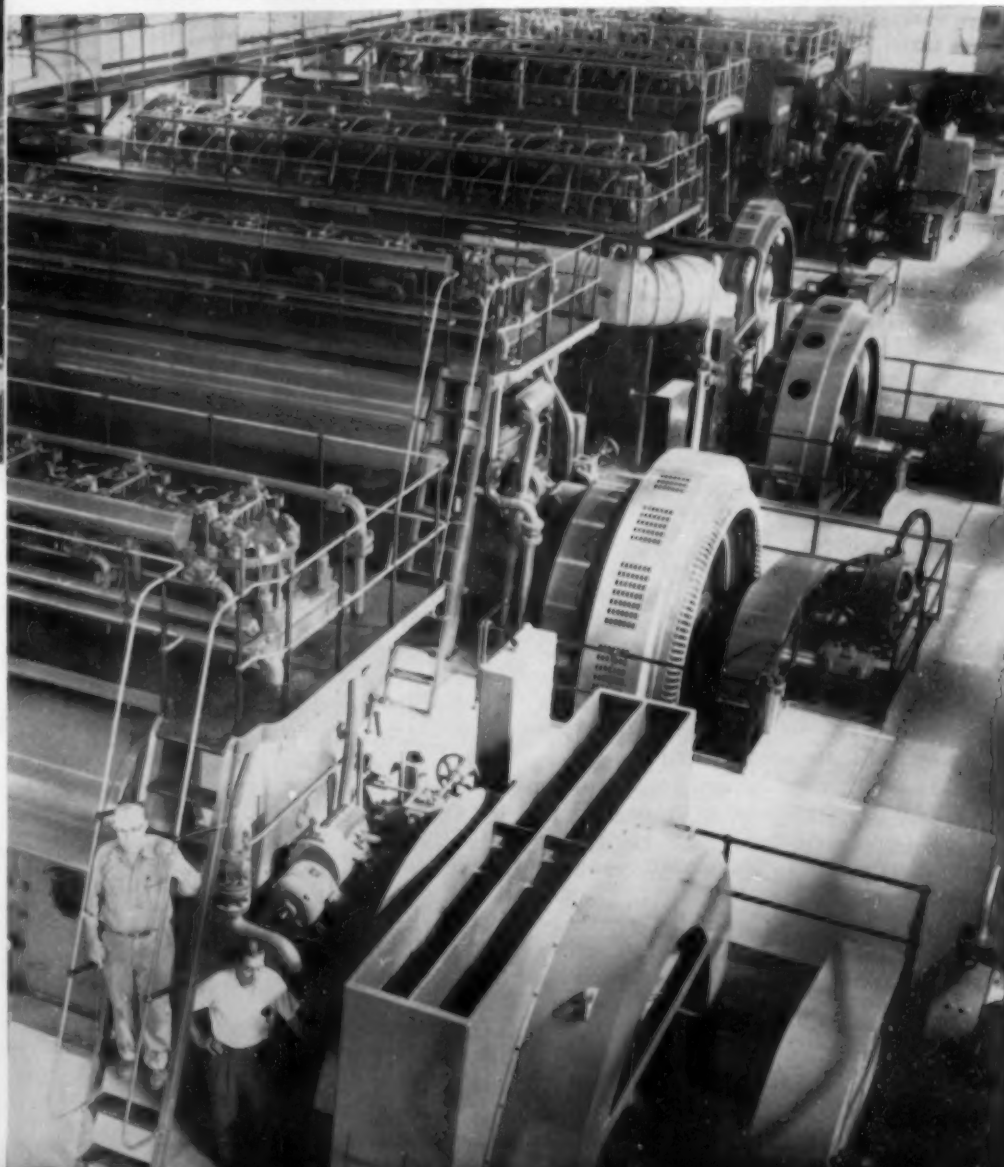
List of Principal Equipment

Engines	Nordberg
Generator & Exciter	Westinghouse
Exhaust Silencer	Burgess Manning
Governors	Woodward
Intercooler	Young
Air Blower	Roots Connorsville
Lube Oil Filters	Commercial
Lube Oil Strainer	Purolator
Mechanical Lubricators	Manzel
Jacket Water Cooler	Ross
Air Filters	American Air Filter
Exhaust Pyrometers	Alnor



This is the new 12 cylinder Nordberg Duafuel unit rated 5900 hp, 4200 kw at 240 rpm.

Ward Chittenden, Chief Engineer (left) and Howard Berry, General Superintendent pose beside the new 5900 hp engine-generator unit. These six Nordberg engines were installed over a 20 year period and have a combined rating of 21,500 hp, 16,000 net kw.



1280 HP TUG *HUSTLER II*

**Oil Transfer Corp.'s Newest Vessel, Powered
By Fairbanks-Morse Opposed-Piston Diesel,
Cuts Full Day Off New York-Chicago Run**

By DWIGHT P. ROBISON

THE new push-pull tugboat *Hustler II* is a real hustler. Powered by a 1280 hp Fairbanks-Morse opposed-piston diesel, this newest vessel in the Oil Transfer Corporation fleet is recording some impressive performance in her first months of service. On her first trip from New York to Chicago with a loaded 20,000-barrel oil barge in tow, she cut a full day off the normal time for the voyage, making the trip in just 6 days 23 hours. It had been expected that the *Hustler's* 16,700 gal. fuel capacity would be adequate to get her to Chicago without refueling. Actually, her owners report that fuel economy was even better than anticipated.

Oil Transfer Corporation is one of the largest independent oil transportation companies in New York, operating tugs, barges and self-propelled tankers. Established in the early '20s, it has grown steadily in volume handled, equipment, and operating efficiency. In drawing specifications for the *Hustler II*, company officials were determined to build a vessel of top quality and utility. She was to be compact, yet powerful; able to pull a barge when conditions did not permit pushing it; efficient on the canals with their occasional low headroom, but able to navigate with safety and speed on the lakes and in coastwise service. She was to be a good place to live and a convenient place to work. Most important, she had to have the guts to deliver full power to the tow for days at a time. Designer of the *Hustler* was the well known naval architect Merritt Demarest of Jersey City, New Jersey, and the tug was built in the Oyster Bay yards of Jakobson Shipyard, Inc. The hull is the fourth of the same design but superstructure and machinery are different. She has a length overall of 90 ft. 4¾ in. with a beam, moulded of 24 ft. and a depth, moulded of 11 ft.

Hustler II carries an unusual amount of machinery for a hull of this size, yet all equipment is readily accessible and there is an outstanding amount of work room. A major factor was the choice of a compact heavy-duty opposed-piston diesel as a propulsion engine. This 8-cylinder model 38D81½ Fairbanks-Morse diesel is rated at 1280 hp at 720 rpm. It drives the propeller at 286 rpm through a Falk marine reversing reduction gear and clutch. The propeller is a 4-bladed 88 x 56 Avondale Marine Ways stainless steel wheel. Stainless steel was chosen because it was felt this metal would stand up better in winter ice and also would be easier to repair. Accessory equipment in the engine room is arranged to leave clear, wide aisles. This was easily accomplished thanks to the small width dimension of this Fairbanks-Morse engine. The O-P diesel drives its cooling water and main lube pumps and in addition there is a motor-driven pump for pre-lube and standby service. Close be-

side the engine is the 8-cartridge lube filter, lube cooler and jacket water heat exchanger. Intake air passes through a filter and exhaust gases vent through a spark arrester and silencer. Belt-driven

ability to flatten out quickly to pass under bridges on the canals. The pilot house is high to provide good visibility while plying the Hudson, the Great Lakes or coastal waters. When a low bridge is



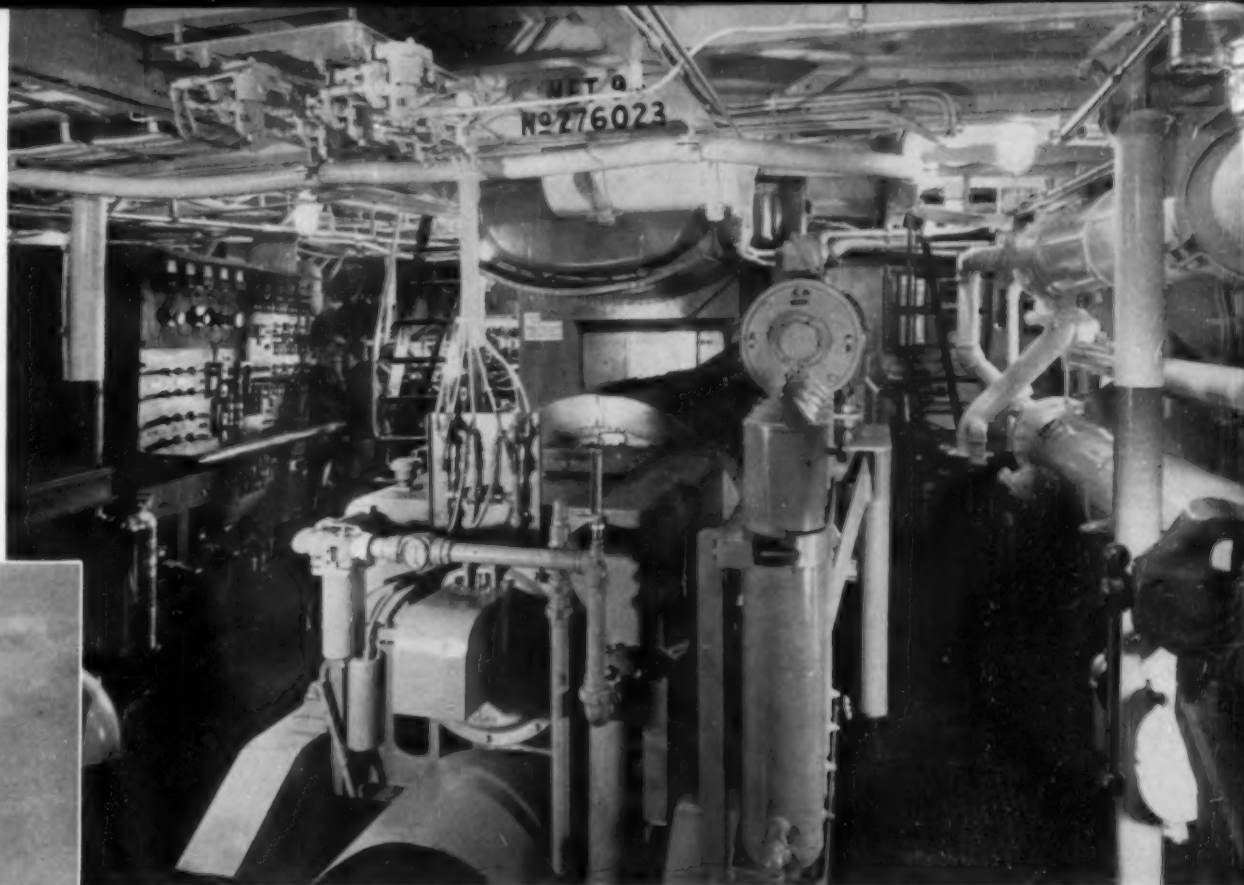
off the main engine is a 25 kw dc generator and in addition, there is a diesel-marine auxiliary generator of equal capacity. There are two air compressors, one motor-driven and one driven by the auxiliary diesel. Convenient to the control end of the F-M diesel are a gauge board, an alarm panel, pyrometer, and pilot house intercom. The steering system is arranged for hand electric and automatic gyro steering. There are two pilot house lever steerers, a full follow-up lever pilot on the starboard side and a non-follow-up controller on the port side. There is also a non-follow-up controller at the aft boat deck station. The vessel has full electronic navigational equipment including a gyro-compass system, a radar system, a radio direction finder, a radio-telephone, and a VHF radio.

An interesting feature of the *Hustler II* is her

encountered on the canal, however, the pilot house can be lowered 6 ft. 5 in. in just 10.8 seconds. This is accomplished with a hydraulic system controlled from the pilot house. Crew members remain in the house and all controls continue to function. The radar scanner has a separate hydraulic system with a telescoping compound ram, also controlled from the pilot house. Finally, the counterbalanced mast is swung down manually. The pilot house can be raised again in 22 seconds. Obviously, raising the house takes a lot more power and the motor-driven hydraulic oil pump is supplemented by compressed air from storage bottles. To meet high water conditions in the canal, the boat can be lowered by filling forepeak and aft-peak ballast tanks, providing additional clearance under fixed bridges. The *Hustler II* is smooth-running and exceptionally quiet. Both the

The opposed-piston diesel drives a stainless steel propeller through a Falk marine reversing reduction gear. This view also shows the Safety Industries generator, F-M lube filter, Ross lube cooler and jacket water heat exchanger.

The *Hustler II* is the newest vessel in the Oil Transportation Corp. fleet. Powered by a 1280 hp Fairbanks-Morse diesel, she cut a full day from normal New York to Chicago towing time. The high pilot house can be dropped hydraulically 6 ft. 5 in.



engine and engine room are engineered for minimum engine room sound levels. There is acoustical insulation in both the engine room and upper engine room. Quarters are attractive and comfortable. There are two single and two double staterooms in the deckhouse and six berths in the fore-castle. The mess adjoins the galley which is equipped with a range and a deep freeze.

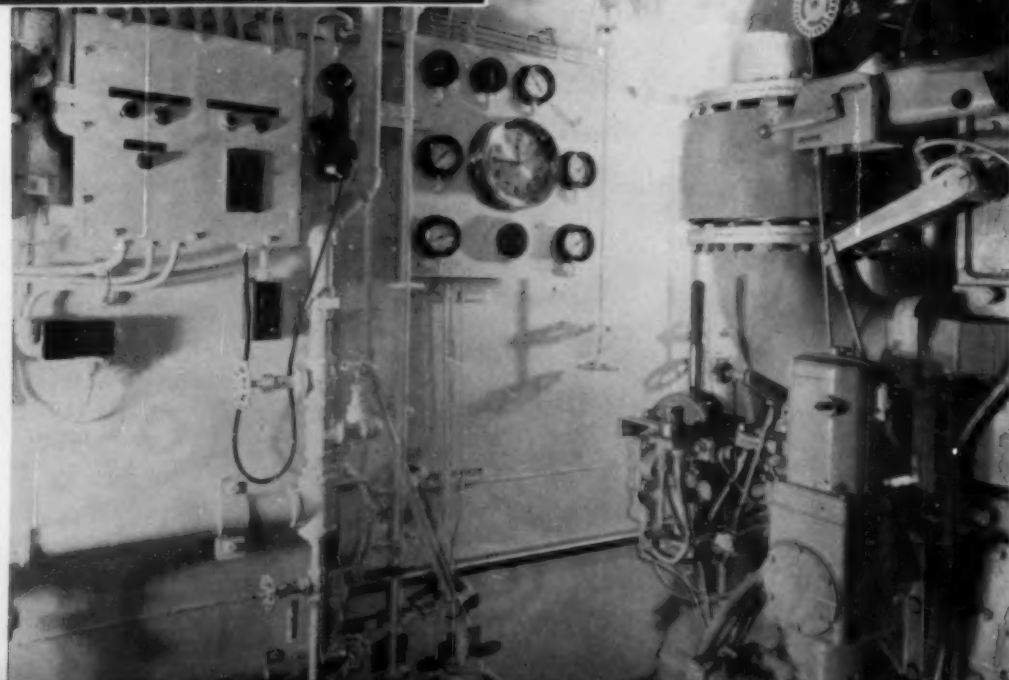
The *Hustler's* job is to tow 20,000 barrel, 230 ft. x 43 ft. barges with 2500 to 3000 ton payload. Most

of the time, she handles a single barge but sometimes is called on to push two or three up the river. She was intended primarily for the river-canal-lake voyages from New York to Great Lakes ports but will be used also to take tows to Eastport, Maine, to Norfolk, and possibly all the way to the Gulf. Her trials in mid-March were highly successful but the new tug got her first real chance to show what she could do on the long tow to Chicago. Speed capabilities mean little on the canals, but about four days are spent on the broad Hudson and on the lakes where a tug and her diesel are called on to deliver a continuous flow of power. Her record of 6 days 23 hours was the answer to this test. Surprisingly, there were indications that the O-P diesel still had additional unused capacity. The records are being studied by Fairbanks-Morse engineers at Beloit, Wis., and there is a good chance that the *Hustler II* will get a larger propeller. If that happens, speed records seem sure to take another beating. For Oil Transfer Corp. customers, the *Hustler II* means better service. For her owners, her performance is like money in the bank.

Principal Equipment Suppliers

Main Engine	Fairbanks-Morse
Reverse Reduction Gear	Falk
Governor	Woodward
Engine Controls	Westinghouse Air Brake
Heat Exchangers	Ross
Intake Air Filter	Burgess Manning
Silencer	Maxim
Air Compressors	Gardner-Denver
Alarm System	Viking
Pyrometer	Alnor

The engine room control station shows the Woodward governor, Westinghouse Air Brake engine controls, gauge board, intercom, and Viking alarm panel.





DIESELIZED CHIPPER CLEARS RIGHT-OF-WAY

ROAD clearing operations in forests of the Pacific Northwest are being revolutionized by a giant portable wood chipper, powered by a 300 hp Cummins model NHRSP diesel engine. The \$40,000 unit, designed by Stan Ehrlich and built by the Sauer Manufacturing Co. of Portland, Ore., literally gulps the debris of the forest, chops it up into small pieces which it then spews out over the forest floor in a fine layer of soil-building, erosion-preventing mulch material.

This unique diesel powered chipper was developed with the assistance of the Pacific Northwest Regional officers of the U. S. Forest Service and went through its shake-down trials in road clearing operations in the Fremont National Forest. Forest Service engineering division men who assisted in its development and supervised the field tests were R. F. Grefe, A. A. Venski, L. A. Waggener and Vern Church, all of whom agree that the new machine has many apparent advantages over the more conventional methods of road clearing, such as cutting, piling and burning.

The chipper, which worked this summer on the Deschutes National Forest a few miles southeast of Bend, Ore., underwent some modifications, and further testing is contemplated by the U. S. Forest Service. "As with any other new piece of equipment," explains L. G. Jolley, assistant regional forester at Portland, "many details of methods or use must be tried out until the best methods are

found. The chipper appears to have great promise." Ehrlich, a co-partner with E. E. Sauer in the company which manufactures the new chipper, contends that the cost of its operation is about the same or a little less than the more conventional methods of falling, piling and burning. "The condition of the cleared right-of-way," Ehrlich continued, "also is a decided improvement over that which results from use of the more conventional methods". Use of the new chipper permits clearing operations to continue through the summer fire season, since there is no danger from slash fires spreading to adjacent timber. Also, the right of way can be narrower, since it is not necessary to clear a space for piling the slash for burning. The chipped residue also can be used to provide an erosion proofing protective blanket on road banks and the sides of fills in road construction.

In developing the new "chip and spread" method of debris free road clearing, the Forest Service procedure was as follows:

A Caterpillar TD-18 tractor with clearing blade pushed over all trees and roughed out the pilot road in the center of the clearing. Two men with a chain saw then bucked off the stumps close to the roots. Then a Cat D-4 was used to pile the stumps and deck the merchantable logs outside the clearing. A $\frac{3}{4}$ yard mobile crane or "jammer" equipped with a log grapple picked up the debris and dumped it into the trailer conveyor section feed-

These photographs are dramatic evidence of the efficiency of giant Cummins powered wood chipper. Right-of-way is left clean and merchantable logs are bunched off to the side.

ing the 21 $\frac{1}{2}$ x22 in. throat, big enough for a 16 log. The chipper hog then gulped down the debris and sliced it fine with 20 10 in. knives. A powerful fan pushing out 19,500 cu. ft. of air per minute then spread the debris 150 to 200 ft. automatically over a 45° angle. The chipper was moved ahead every 15 to 20 minutes and cleared about a quarter mile of right a way each day. The D-4 Cat that previously was used to deck the logs also tended the chipper, pushing big limbs and small trees up to the loader.

The big wood chewing machine is one of the largest portable chippers ever made and is powered by a 300 hp Cummins diesel engine with super-charger. The big 12 blade, 48 in. blower fan is whirled at 1500 rpm by another 160 hp Cummins diesel engine. The conveyor has three 19 ft. sections with the trailing sections demountable for over the highway moving. Entire unit is mounted on a 34 ton lo-boy semi-trailer pulled by a Diamond T truck tractor. Loaded weight of the trailer is 50,078 lbs. The over-all traveling length is 56 ft. and the height is 12 $\frac{1}{4}$ ft.

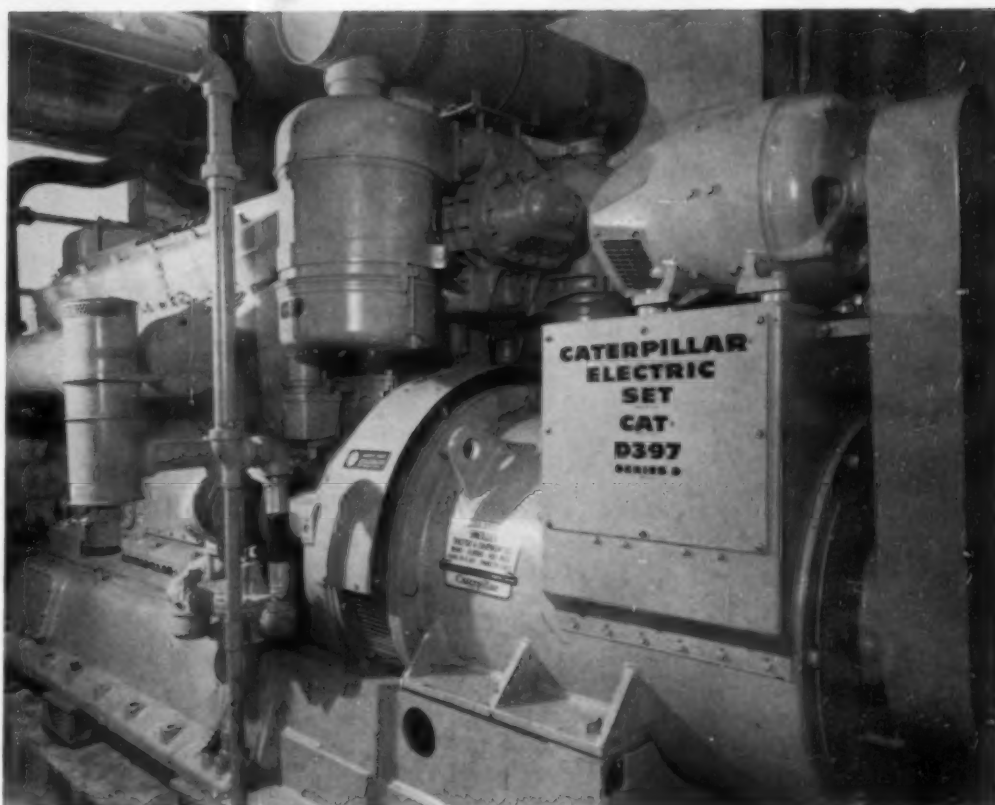
DIESEL SAFEGUARDS MERCY HOSPITAL

By ED DENNIS

AN "angel of mercy" stands by for lives at stake at Mercy Hospital. At least that's what the doctors and staff call the recently installed diesel power plant at their hospital in Miami, Florida. Because power for the regular utility company is not always dependable, especially during hurricanes and other sub-tropical storms, the hospital officials decided to install a reliable emergency diesel-generating plant to guard against any catastrophe resulting from loss of electricity. Selected was a model D397 Caterpillar diesel engine rated 450 hp that drives a Cat generator rated 375 kva, 120/208 volts, 1040 amps.

Foundation of the new engine-generator unit was poured concrete and steel and Norfund vibration eliminators were employed. Young radiator heat exchangers are used for cooling. A Maxim MU-3#16 silencer takes care of the noise and the exhaust problem. A Quincy air compressor was installed along side of the engine. The switchboard and controls were supplied by the Tampa Armature Works of Florida.

The installation of this 450 Caterpillar standby diesel generating set has given Mercy Hospital a security that can not be measured in dollars and cents. With automatic starting and stopping mechanism, the big machine, can be on the line with full load in a matter of minutes. The hospital no longer fears the crippling effects of a power failure.



The 375 kva Caterpillar self regulating constant voltage generator, powered by a model D397 series D Caterpillar diesel engine, rated 450 hp, 1200 rpm. It was supplied by Shelley Tractor & Equipment Co. of Miami, Florida.

FIRST ALUMINUM TUG M/V SUMTER

FIRST aluminum tugboat to be built in the United States and the first aluminum vessel of any type to be certified by the American-Bureau of Shipping has successfully completed trials and is now in service. Named the *M/V Sumter*, the vessel was built by Bryant Boats, Inc., of Bayou LaBatre, Ala. in cooperation with Kaiser Aluminum &

Chemical Sales, Inc. The 55 ft. all-welded boat is designed for use in the bayous and marshland oil fields of Southern Louisiana. Its shallow 4½ ft. draft, made possible by its aluminum construction, will permit its use in waters too shallow for conventional tugs of this size. Corrosion-resistant, high-strength weldable aluminum alloys developed by

Kaiser, were used in construction. The tug was designed by Friede and Goldman, New Orleans firm of naval architects. Its power plant, two General Motors (Detroit) 6-110 model diesel engines, was supplied by Kennedy Marine Engine Company of Biloxi, Miss., and sale of the vessel is being handled by Calvert Marine Services of New Orleans.



The only non-aluminum parts in the boat are those in the engines plus the propeller and propeller shaft which are made of bronze. Electrolytic action is prevented by separating dissimilar metals, i.e., the tailshaft of bronze is isolated from the aluminum hull by rubber bearings set in aluminum shells. "The principal advantages of this vessel will be extremely low maintenance and long life, and light draft for use in shallow water," said Oliver Bryant, president of Bryant Boats, Inc. "We selected a hawser tug for our aluminum prototype because we thought this would have a particular appeal to the oil industry operating offshore in the Gulf Coast area. However, we have every reason to believe that a towboat built of this material would offer the same advantages of low maintenance and light draft, particularly in inland areas where we have peculiar corrosion problems."

Hull, bulwark, pilot house, decking and all other major structural components of the *M/V Sumter* were constructed of Kaiser aluminum.



WHAT'S GOING ON IN ENGLAND

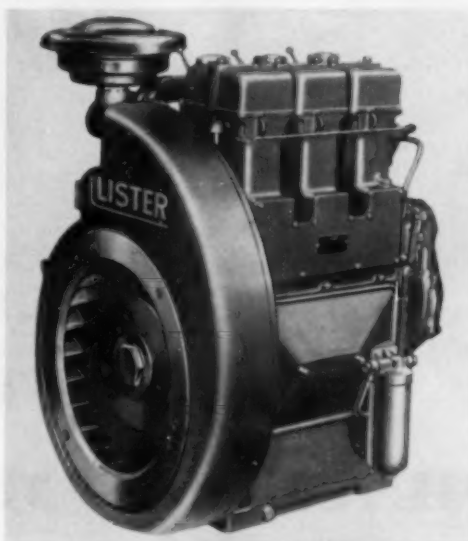
CONDUCTED BY BERNARD W. LANSDOWNE

Bernard W. Lansdowne is an associate member of the Institution of Mechanical Engineers and is widely known among British and European diesel manufacturers as a former editor of our English contemporary "Gas & Oil Power." His early workshop training was spread over seven years with A.E.C. Ltd., Southall, following which he served some five years with that company's sales engineering department. He is now specializing in industrial advertising with Roles & Parker, Ltd. in London.

Lister Extend Their Air-cooled Range

R. A. LISTER & CO., of Dursley Gloucester have, for some considerable time, been producing small single and twin cylinder air-cooled diesel engines of $3\frac{1}{2}$ hp per cylinder and production of these units is being maintained at a substantial level. It is now announced that two further Lister air-cooled ranges are to be produced to supplement the established design and provide a considerably increased choice of power output. The first new range is simply a large-bore version of the existing design with the addition of a 3 cylinder unit, the output per cylinder now being $4\frac{1}{4}$ hp, at 1800 rpm. This power output is intended to bridge the gap between the established smaller engines and the other new range of 20 and 30 hp, twin and three cylinder engines. This latter new series known as the Lister HA range, is based on a cylinder size of 4 in. bore by $4\frac{1}{2}$ in. stroke and in common with the other units mentioned, has a max. working speed of 1800 rpm.

The new engines have inherited many of the characteristics of their predecessors, notably simplicity of design, good starting and an economic fuel consumption. Direct injection for the fuel is provided by an injector of a patented design in conjunction with an interesting combustion chamber in the piston crown. The engines are built-up on a crankcase of sturdy construction designed to give a good margin of strength with low weight. The crankshaft is also of substantial proportions with 3 in. diameter journals, and is cross-drilled for pressure lubrication of the shell-type big end bearings which are prefinished steel backed copper-lead lined, the upper half carrying an oil groove and the bottom half being plain. Carbon steel forgings are used for the connecting rods in which the small end bush is steel backed and bronze lined. Their design is such that it is not necessary to withdraw the connecting rod up through the bore. Instead it can be removed as a complete assembly, including the piston and cylinder barrel. The design of the aluminum alloy pistons incorporates an open type combustion chamber consisting of four lobes forming a clover leaf pattern in the bowl. This is claimed to ensure thorough mixing of the fuel and air which, coupled with a compression ratio of 17 to 1 makes for good starting characteristics. The engine can easily be hand started by two men at a temperature of minus 4°



30 hp Lister air-cooled diesel.

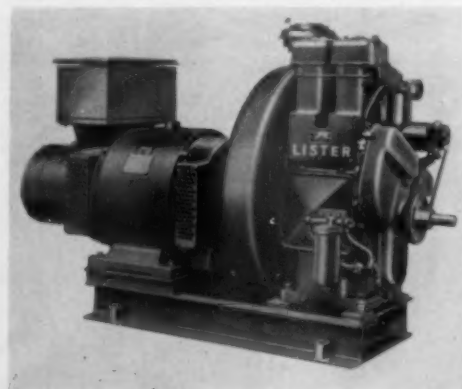
F (36 degrees of frost) without any starting aid.

A high grade of cast iron is used for the manufacture of the cylinder barrel and the head, both of which have been provided with generous finning to give good cooling under all conditions of operation. Large size manifolds are so arranged that the inlet manifold is below the exhaust whereby the heat from the exhaust is not transmitted to the inlet. A special feature of the engine is the long term development undertaken to obtain the best possible cooling of the injector nozzles. The nut which secures the nozzle of the injector body is finned and the body is heat insulated from the cylinder head itself. These features of the combustion chamber and the injector are both subject to pending patents. A separate fuel pump is provided to each cylinder. Engine cooling is by means of a centrifugal fan bolted to the flywheel, cooling air being trunked round the cylinder barrels and over the finned nut of the fuel injectors by bafflers which maintain a constant flow to all parts of the engine. A flywheel is keyed to a taper at one end of the crankshaft while at the other end is situated a gear train enclosed by a steel pressing. The crankshaft pinion in this train drives the camshaft gearwheel which in turn drives the

governor at higher than engine speed. Below the crankshaft pinion is an idler wheel driving the lubricating oil pump. The governor mechanism provides very close speed control and is fitted with a heavy duty grooved ball thrust race. The lever is sprung to allow for remote stopping without having to overcome the heavy governor spring. The governor maintains the settled variation of revolutions within $4\frac{1}{10}\%$.

Engine lubrication is provided by a rotary pump of compact dimensions situated at the gear-case end of the engine and taking its supply through a suction strainer. It delivers oil under pressure to the main bearings, valve rockers, gear train, etc. A restrictor pipe is not used to the valve rockers; instead a long-pipe of small internal diameter is employed to feed the valve rockers which is not prone to blocking. Particular attention has been paid to the elimination as far as possible, of fuel oil and lubricating oil leaks. The fuel pumps, usually a problem as far as leaks are concerned, are of cast iron and the unions connected to the pumps are sealed with a specially designed washer. All the sheet metal covers to the engines have thick oil resistant rubber jointing and there are internal oil throwers at both ends of the crankshaft to prevent oil creeping along the shaft. A full range of power take-offs and accessories are available for use with these new engines, and for installations where it is necessary for the air to be ducted away from the engine a trunking adaptor can be supplied for coupling the ducting to the engine.

20 hp Lister air-cooled diesel.



BARGE 539 in tow of tugboat *Winquatt* on the Columbia River near Vancouver, Wash.

SEA-GOING *BARGE 539* ENTERS COASTAL SERVICE

A NEW barge with a quoted cargo-carrying capacity that reads like a supply order for an around-the-world task force cruise has been put into service along the Pacific coast and the Columbia River system. Known as *Barge 539*, it is the latest addition to the 39 member barge fleet of the Upper Columbia River Towing Co. of Vancouver, Wash. and its associated companies. Commissioned in April she is hailed by her owners as the world's largest barge. Together with the 4050 hp towing vessel *Winquatt*, she is expected to tour the entire extent of the Pacific coast from the Bering Sea to Mexican coastal waters carrying a variety of bulk liquid and dry cargoes, construction equipment, vehicles and packaged commodities.

The barge is 299 ft. long, 75 ft. wide overall and has a hull depth of 21 ft. Sub-divided and framed much like conventional self-propelled tankers, almost the entire hull space below the main deck may be used for bulk liquid cargoes. Up to 106 fully loaded 40 ft truck trailers can be placed on board. Three mounted cranes with complete range of the deck and a battery of high output transfer pumps eliminate the necessity of specialized equipment on shore for loading and unloading. Power on board is almost 100 per cent Diesel. Cargo-carrying capacity reads in terms of millions more often than not. Aviation fuel, automotive fuel, heating oils, asphalts, and other liquid cargoes can be carried in quantities exceeding 3,000,000 gal. In ocean service a cargo of 5,000,000 board feet of lumber is possible. Dry cargo space of 170,000 cu. ft. is available in a cargo house measuring 22 ft. high and extending almost the entire length of the deck. The hull is divided into 32 cargo tanks with loading and discharge piping arranged to insure maximum separation of various types and grades of liquids. Pumping requirements are met by four deep well type pumps each powered by a 6-110

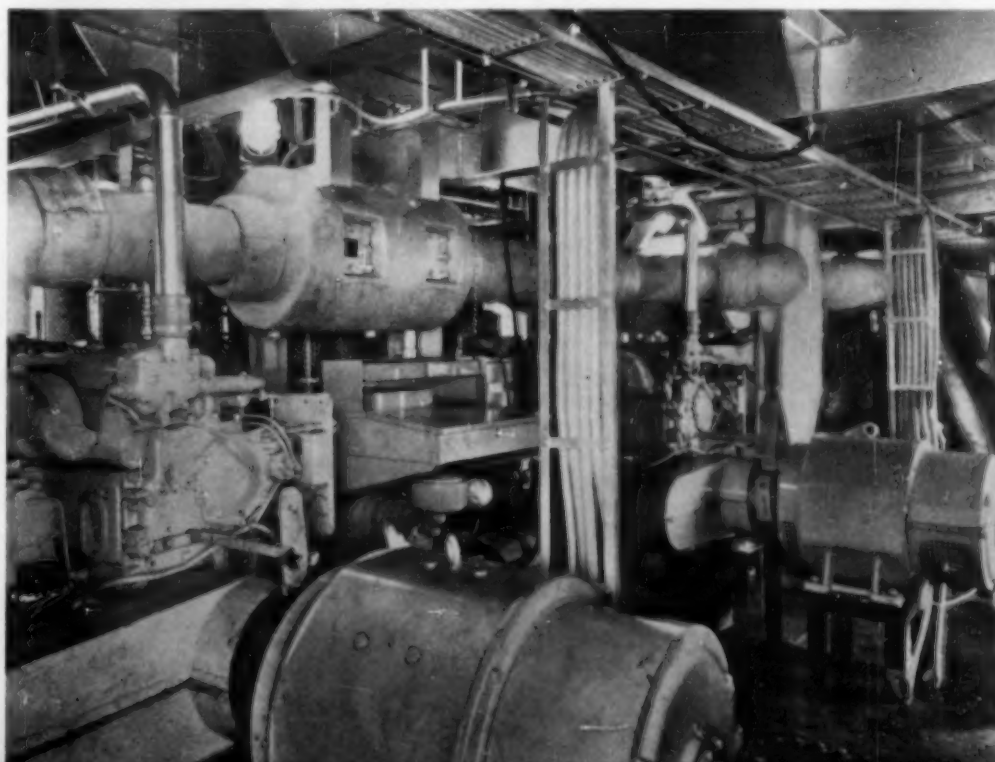
GM Detroit diesel engine. The combined maximum capacity of the four pumps is said to be 14,000 gpm.

To handle dry bulk cargoes including containerized and palletized cargoes, the barge is equipped with three permanently installed pedestal-mounted Manitowoc cranes with 75 ft. booms. Each is powered by a 6-71 GM diesel engine operating through a Twin-Disc three stage torque converter. Equipped with air controls, the cranes have a lifting capacity of 75 tons working within an 18 ft. radius and 30 tons within a 55 ft. radius. Each crane is elevated sufficiently to permit swing clearance over deck loads as high as 39 ft. above the main deck. Four hatches in the cargo house permit opening a large portion of the sheltered area to direct stowage by cranes as well. The owner's long experience with exposed ports of the Pacific Coast has given rise to an anchor arrangement well in excess of regulation requirements. The heaviest gear is at the stern and consists of three anchors

totalling 15 tons. At the bow the barge is fitted with a 2½ ton mushroom type anchor. Electrical power requirements for anchor machinery is provided by two 60 kw dc Delco generators. Diesel-driven also, each generator is mounted to a ship's pump engine through a Waldron cutout type front connection. Ships lighting and ventilation power requirements are provided by a 30 kw ac generator driven by a GM 3-71 diesel engine.

Barge 539 was designed by the firm of Philip F. Spaulding and Associates, naval architects and marine engineers. The design reflects the owner's special requirements and represents many new features in barge design. The owner's project supervisor, during design and construction was S. A. Soter. The barge was constructed on an accelerated schedule by the Seattle Division of the Todd Shipyards Corp. L. R. Glisten, naval architect, represented the owner during construction. GM engines were supplied by Gunderson Bros. Engineering Corp. of Portland.

Engine room of the barge where electrical power for anchor machinery is produced by these two General Motor Detroit diesels driving Delco generators rated at 60 kw each.





GAS TURBINE PROGRESS

A COMMENTARY BY R. TOM SAWYER

R. Tom Sawyer's well known in the gas turbine field having been the first chairman (1944) (and now treasurer) of the Gas Turbine Power Division of ASME. He spent 7 years with G.E. Transportation Dept., and 26 years with American Locomotive, now Alco Products. At present he is a Consultant, including "Consultant to the Staff" of the Experimental Towing Tank at Stevens Institute of Technology. In addition to being a Fellow Member of ASME and AIEE, he is a member of SAE, ARS, ANS, IME in London, DEUA in London. He is also a member of Franklin Institute and a Professional Engineer. Mr. Sawyer is the author of *The Modern Gas Turbine* and *Gas Turbine Construction*, and co-author of *Applied Atomic Power*.

Introduction To The 1958 Gas Turbine Progress Report

SIX years have passed since the last progress report was written. These six years have brought the gas turbine to the front much sooner than many of us expected. Today gas turbine power is being used in practically every type of application suitable to prime movers. In many cases it is used in just an introductory manner; in other fields the gas turbine is well entrenched as you will see in reading these progress reports. The authors of the following reports are to be highly commended for producing factual data which has been selected from a tremendous amount of available information. We are fortunate in having such highly qualified men to present each of these reports. The following is a very brief summary of the papers submitted. Complete details will be found in each of these papers.

MATERIALS—This is one of the most important items in the gas turbine field. No matter what tricks are used to reduce the temperature of the gas turbine the best material is preferred. Intensive studies have been made to reduce the cost of component parts by the use of alloys which are both cheaper and better. There is an interesting point brought out in the paper which states, "same emphasis must be placed on the physical properties of metals at low ambient temperatures, especially when gas turbines are required to operate under adverse starting conditions" and a few seconds later shoot up to the abnormal high temperatures required.

TURBINE COOLING—Turbine cooling has been very carefully studied especially during the past six years. Many tests have been made and certain results obtained. However, turbine cooling has not yet been used commercially except in a minor way. This means the desired "break through" to materially increase turbine efficiency by using temperatures above 2000 F has not yet arrived commercially. Pomatrada does have a turbine operating on 2200 F which has liquid cooling of the blades and apparently is operating very satisfactorily. Even this is not yet ready for the commercial market. Today it is an excellent research tool. The next six years should show a marked advance in turbine cooling and possibly turbine inlet temperatures up to 3000 F.

FUELS—Gas turbines have been operated very successfully on natural gas, jet fuel and distillates. However, the big difficulty comes with residual fuels and coal. This progress report on Fuels gives an excellent account of progress to date on the burning of residual oil, while the progress report on locomotives includes that of the burning of coal as the railroad and locomotive industries have been most anxious to find a means of reducing the cost of fuel over that of the diesel locomotive.

CYCLE COMPONENTS—Dr. Martinuzzi has done a remarkable job in picking up the loose ends for this general report. Here he has referred to several types of heat exchangers; the rotary disk type, the rotary wheel type, a reciprocating type as well as the stationary plate type. The smallest gas turbine (7 kw), the Turbo-Mite, as well as many unusual designs of medium and large units are described. There is also discussion on the use of the differential gear in various types of gas turbines for improving acceleration of the unit, particularly when attached to a vehicle.

COMPOUND PISTON AND TURBINE ENGINES—This report would not be complete without this particular chapter as the gas turbine has been used to a major extent with the reciprocating engine. In fact the compound engine does

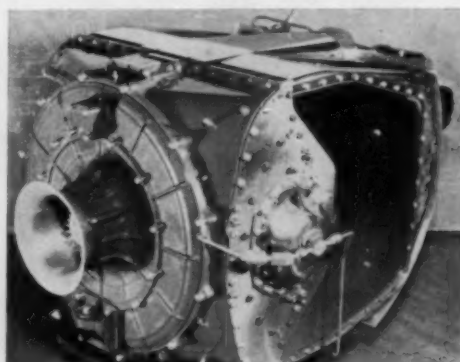
require the gas turbine in order to obtain its best results. These two when properly matched do produce a most efficient power unit. It should be mentioned that practically all modern diesel engines today, even of the two cycle type, are being turbocharged. This means the mass production today of small gas turbine component parts.

AVIATION—Dr. Lancaster emphasizes the importance of aviation. He itemizes only a few units in sufficient detail to show that of these five types of jet gas turbines one-half billion horse power has been produced. Six years ago the jet was considered the prominent power plant for military aircraft. Today it is just starting to replace the reciprocating engine in commercial aircraft. The jet unit has come through with such a wallop in recent years that no more reciprocating engines will be used on large planes, commercial or otherwise. In other words, the gas turbine has taken over the aviation field whether it be used as a jet, a prop or some combination. Today aviation is gas turbine's biggest business.

AUTOMOTIVE—Here is a field that the gas turbine has not yet broken through. In the past six years at least seven manufacturers have produced one or more gas turbine propelled automobiles. Not one has yet become commercial. The present automobile is extremely flexible, powerful, and reliable—therefore difficult to improve. The gas turbine automobile must be a better car than the present. However, new gas turbine power plants produced by those in the automotive industry are beginning to look as though they can compete on both efficiency and weight per horse power ratio. The major questions now are performance and cost. The gas turbine auto still has a time lag in acceleration which is minor, but objectionable. The cost can be reduced mainly by quantity production.

THIS SUMMARY TO BE CONCLUDED IN NEXT MONTH'S ISSUE.

The Complete Report Can Now Be Purchased From ASME, 29 West 39th St., New York 18, N. Y., At \$5.00 Per Copy To Non-Members, \$4.00 To Members Of ASME.



General Motors latest gas turbine power plant, the Whirlfire model GT-305, now under development. The full load rating of 225 hp will make a weight ratio of less than 3 lbs. per hp. Dimensions of the unit are: length, 37 in.; height, 27.8 in. and width, 26 in.

BURMEISTER & WAIN BUILDS 15,000 HP MARINE DIESEL

BIGGEST marine diesel engine Burmeister & Wain have ever built is now being tested. Ordered by owners, Olsen Brothers A/S of Stavanger, the engine is to be delivered to Rosenberg Mek. Værksted, Stavanger, for installation in a 32,000 ton tanker. This engine is the natural consequence of the rapid development started in 1952 when Burmeister & Wain were one of the first diesel engine manufacturers to introduce a turbocharged two-stroke diesel engine. With this new engine type, characterized as one of the most significant events in the diesel engine field in the last 25 years, a possibility was created for the application of diesel engines in far larger vessels than heretofore; this was primarily of importance to large tankers.

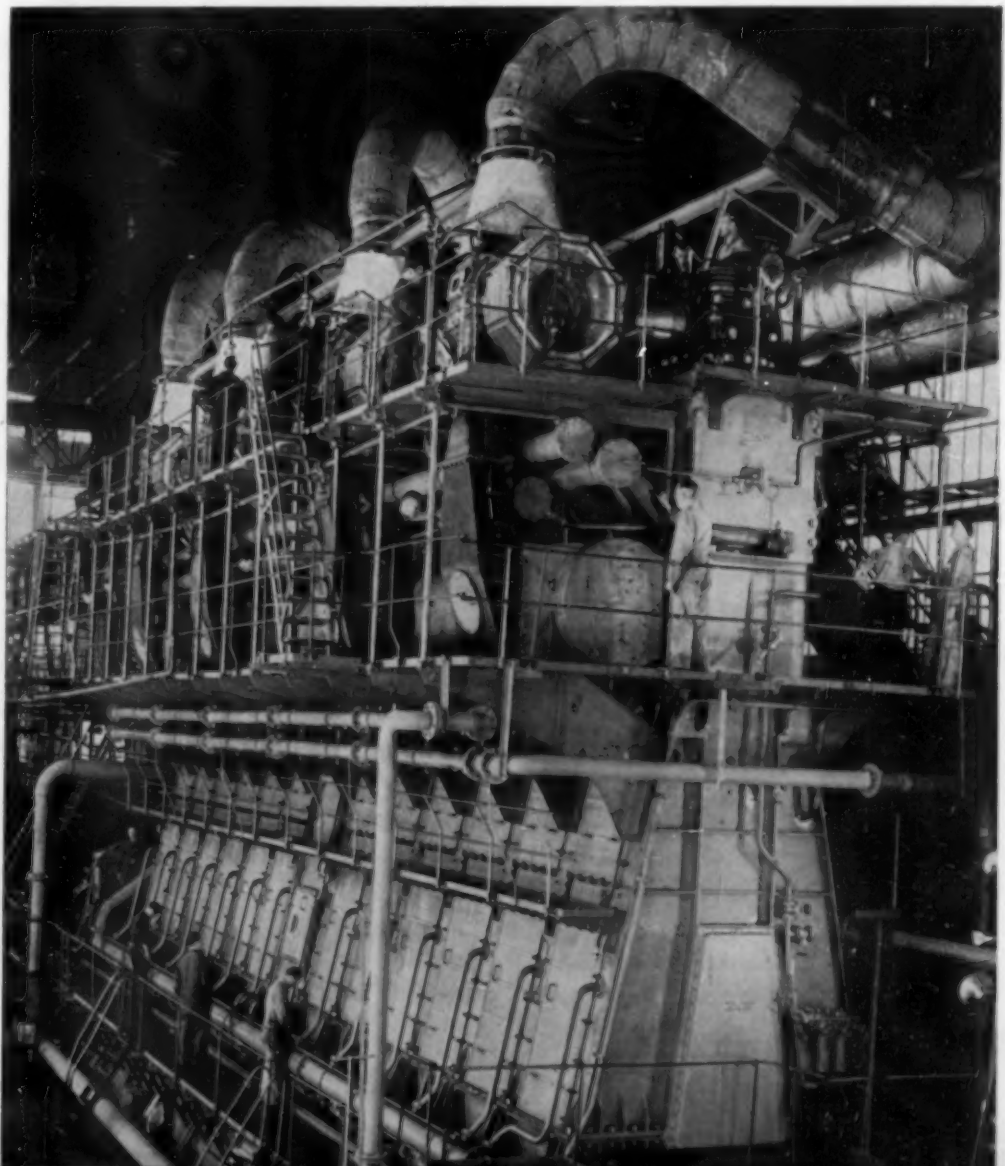
At present more than 100 motor tankers of over 30,000 tons deadweight are under construction or on order; two thirds of these will be equipped with turbocharged B&W diesel engines. The 12 cylinder engine now being tested here at B&W's Christianshavn engine works and which is to be shipped to Rosenberg Mek. Værksted towards the end of this month is not only the largest marine diesel engine built by Burmeister & Wain but is also believed to be the largest marine diesel engine in the whole world. At 115 rpm, it develops 15,000 bhp and will be capable of giving the 32,000 ton tanker a speed of 16 knots. Hitachi in Japan, building B&W diesel engines on license through Mitsui, has already delivered one B&W diesel engine of this magnitude, and several 12 cylinder B&W diesel engines are under construction with licensees in Sweden, France, Spain and Japan. Altogether there are at present more than 30 such B&W diesel engines on order.

To meet the demand for diesel engines for even the very largest vessels that can be built today, Burmeister & Wain took yet another step forward in 1957 by introducing a two-stroke turbocharged diesel engine with a cylinder bore of 840 mm (33 $\frac{1}{8}$ in.) and a piston stroke of 1,800 mm (70 $\frac{3}{4}$ in.) which in continuous service at sea will develop over 1,700 bhp per cylinder at 110 rpm, i.e. a considerably larger horsepower output than normally achieved by a marine diesel engine; thus, there are no longer any limits to the marine application of diesel engines. The East Asiatic Company, who became pioneers in the use of ocean-going diesel engine ships and to whom in 1912 Burmeister & Wain delivered the world's first ocean-going motorship *Selandia*, were the first to adopt B&W's new large engine type when in 1957 they ordered a 6 cylinder plant for installation in a tanker of 18,500 tons deadweight. An even larger plant has been ordered by the Belgian oil company, Petrofina. This company, which controls a tanker fleet

of more than one million tons deadweight, had originally contracted for a tanker of 34,000 tons deadweight with B&W, but after the appearance of the new engine type the order was altered to one for a tanker of 45,000 tons dw. in which a 12 cylinder B&W engine of 22,000 bhp was to be installed.

To facilitate the building of the new large diesel engines it has been necessary to plan comprehensive extensions and modernization of the engine works. Thus, a new shop for the testing of the large engines is being erected. The shop will be 26 ft. 3 in. higher than the existing test shop, the height being about 92 ft., the width about 75 ft. and the length about 295 ft. giving a total floor area of no less than 23,000 sq. ft. A test bed foundation extends the full length of the shop. This will allow erection and testing of up to three of even the largest engines at one time. In the shop, cranes operate at two levels. Uppermost, a 100 ton erection crane and below that, two 35 ton cranes. Adjoining the test shop a three-story building to accommodate assembly and pipe fitting shop will be built so that, from each respective shop, there is direct access to the engines on the

test bed. The extensions also include lengthening and modernizing the crankshaft shop. This, in addition to increasing the firm's possibilities of supplying main engine crankshafts for its own use and to its licensees at home and abroad, will also create possibilities of increasing B&W's export of such large engine parts to other works. Already B&W have a considerable number of export orders in hand, and it is anticipated that in 1959 half the production will be for export. B&W's efforts in recent years have brought them a large number of orders so that it and its licensees now have contracts for the building of B&W engines totalling more than 3 million bhp, of which all but a few are for turbocharged units. Since the appearance of the first turbocharged two-stroke engine in 1952, orders placed for B&W turbocharged engine plants represent a total output of 6,087,325 bhp of which 2.8 million have been delivered. In all, Burmeister & Wain now have 24 licensees in Belgium, Denmark, England, Finland, France, Holland, Italy, Japan, Yugoslavia, Norway, Spain, Sweden and Germany. Moreover, Burmeister & Wain have subsidiary companies in France, Norway, U.S.A., Canada, Spain, and South Africa.



Rated 15,000 bhp at 115 rpm, the giant Burmeister & Wain turbocharged two cycle diesel is shown on test at the firms Christianshavn works.



DIESEL SERVICE PROGRESS

A COMMENTARY BY GEORGE R. MACKEY

George R. Mackey was long associated with Detroit Diesel Engine Division of General Motors Corp., and had prior experience as a mechanic in Europe and the U.S.A., which enabled him to become well acquainted in the diesel and service fields and to obtain a broad scope of the service industry from the customer's and management's viewpoint. Further training at Carnegie Tech and in the Army Ordnance during World War II provided the necessary requirements in planning service programs. Progressive advancement in diesel service areas in General Motors and with Detroit Diesel led to his position as Supervisor of Service Promotion. Upon termination of employment with General Motors in 1952, he joined Clayton Manufacturing Company, and his present position with this organization is Sales Manager of the Dynamometer Division.

Tools And Equipment

ANY member of management who is responsible for the successful operation of a Service Department, regardless of the type of business—fleet, contractor's service, engine or equipment distributor, must recognize the importance of having and using correct tools and equipment. The proper use of tools and equipment plays an important part toward improving customer acceptance and satisfaction. An analysis of tool and equipment requirement for use in a service operation must certainly include: (1) the classification of tools and equipment and the effectiveness of their proper use on productive man-hours; (2) the importance of training service personnel to use, maintain and store tools and equipment safely and properly; (3) the necessity for periodic inspection to maintain the efficiency of tools and equipment; (4) methods to apply for correct determination of tool and equipment requirements. One very important factor that is often overlooked but must be included in analyzing tool and equipment requirements is that they become obsolete and must be replaced with more modern developments since up-to-date tools and equipment play an important part toward controlling the income and productivity of a Service Department. While Managers of service operations must be aware of the important part up-to-date tools and equipment play in the minds of mechanics who actually do the work, Retail Managers must also consider how this work, or end results, affect the interest of the customer. The classification of various types of tools and equipment to produce these desired results must be considered when analyzing the requirements to meet the operation's obligations. Another important factor that must be considered when determining the tool and equipment requirements is what methods can be employed to inform the customers as to the selection of equipment and the superior service that can be obtained from a well equipped shop.

When determining the tools and equipment requirements for any service operation, there are certain questions a Service Manager should ask himself. Some of these are: Why is it that certain mechanics prefer to perform one type of service? Are they creatures of habit—of training? Are they really interested in one type of service? Do they

have the proper tools and equipment to do a quality job? As a Retail Service Manager, have you ever told an owner of an engine or tractor competitive to the line you normally handle that you are sorry but you cannot service his equipment because you do not have the necessary tools and equipment to do a quality job? Answers to all of these questions point out that the main reasons mechanics dislike working on certain makes of engines, tractors, and other equipment, is because they do not have the tools and equipment to do the job properly. Also, that tools and equipment have a definite effect on the mechanics and the completeness of the service that can be performed. Other questions that must be considered by the Manager of a retail service operation are: (1) Are customers interested or impressed by the tools and equipment in the Service Department? (2) Are customers interested in the results obtained from the use of tools and equipment? While the answer to the question regarding the customer's interest in tools and equipment may be yes or no, he is certainly interested in the results obtained by their use. When considering the results that the customer is interested in obtaining, we must determine: (1) If the customer will get a quality job. (2) Will the job be done quickly? (3) Will the job be done thoroughly? (4) Will the job be done without any element of guesswork? (5) Will the job be done correctly the first time? Answers to all of these questions will indicate a definite relationship between various tools and equipment and the ability of the Service Department to fulfill its complete responsibility, to render the best possible service.

There are various types of tools and equipment required in the profitable operation of a Service Department. These can be classified as: 1. Hand tools, special tools and standard shop equipment. 2. Labor saving tools and equipment. 3. Merchandizing tools and equipment. 4. Quality control tools and equipment.

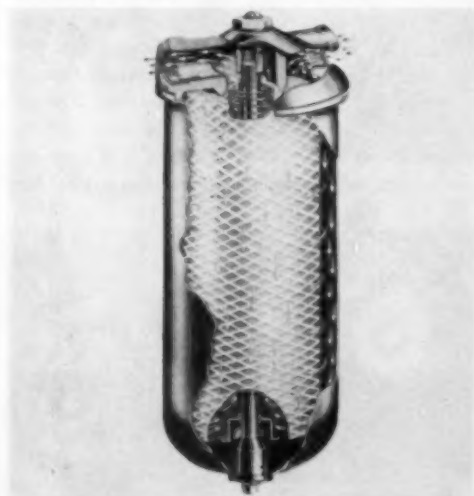
Hand tools, special tools and standard equipment, while varying with each type of service operation, are generally considered as those items that must be present to operate any Service Department. Labor saving tools and equipment are

those items that, when present, will aid materially in the saving of time per job and the overall productivity of the Service Department. Merchandizing tools and equipment are the items that, if present, will aid in selling service jobs and influencing potential customers on the superiority of the service. Quality workmanship tools and equipment are the items that, if present, will aid materially in up-grading the quality of service offered. Any tool or piece of equipment used in a Service Department can be classified under one of the aforementioned categories. There are some items that may fit under many categories. For example, adequate test facilities, while primarily considered as a quality control item, will save many hours of warranty labor and will also influence the customer in the quality and completeness of the service available.

A further breakdown of standard tools normally used in a service operation will result in classifying these tools in such categories as: 1. Mechanic's hand tools. 2. Special tools. 3. Standard shop equipment. Mechanic's hand tools include such items as pliers, screwdrivers, hammers, standard wrenches, etc. It can readily be seen that without these tools no mechanical work of any type could be accomplished. Furthermore, such tools have a direct effect on the productivity of a service operation. It is often found that some mechanics have too few tools and lose valuable time borrowing from other employees. This practice must be discouraged as it not only breeds discontent and ill feelings among the employees, but has a direct effect on productive man-hours. While many operations expect each mechanic to furnish his own hand tools, some shops feel it is far better to assign a complete set of hand tools to each mechanic. He is held responsible for the condition of all tools, and must return the complete set upon termination of employment. While both methods are commonly used, Service Managers of shops that furnish hand tools report a minimum of borrowing and a resulting high productivity. Special tools are those items that are necessary for specific phases of service and generally include such items as seal pullers, bearing removers, special wrenches, sockets, etc. While these tools are generally the property of the Service Department,

the methods for assigning them to mechanics will vary. Some shops use a check-out system; others may mount tools of this type on a board for mechanics to use as required. Shops that are departmentalized often assign the special tools needed to each department and make the mechanic handling the particular department responsible for them. While the attitude of management for each method will vary, there are certain pros and cons that can be considered. Some consider the check-out system to be too time-consuming. Others find that when mechanics have free access to special tools, they may not be replaced immediately, and sometimes these tools end up in a mechanic's tool box or bench drawer. Those shops that are departmentalized and make the selected mechanic responsible for the tools assigned to his department appear to have very little trouble keeping track of tools and report no loss of time caused by waiting for the tools required for the job to be performed. Generally, it would be extremely difficult to follow recommended procedures using only ordinary hand tools, and in many cases it is almost impossible to do a job properly without the use of special tools designed for the specific job. Standard shop equipment generally consists of large, or power driven items required for the shop operation. Some of the items that are classified under this category are: hoists, benches, drill presses, grinders, etc. These items are generally concluded as necessities for the profitable operation of the shop and are the property of the Service Department.

Stainless Steel Filter



Made with a one-piece drawn shell of #316 stainless steel, this new SSB10 Fulflo Filter resists chemical attack and oxidation. It provides micro-clarity of liquids and gases at operating pressures up to 150 psi. Flow rate is 2 1/2-5gpm for liquids of aqueous viscosity. Two pipe sizes are available in 3/8 and 1/2 in. size. Air vent and drain plug are included. The filter employs honeycomb filter tubes in a variety of synthetic fibres to resist solutions chemically hostile to cotton. Nylon, orlon, dacron, dynel, acetate and glass fibres are available. Tubes are manufactured in a wide range of controlled densities to obtain the exact degree of micro-clarity required for each operation. Honeycomb filter tubes have hundreds of filtering tunnels to provide depth filtration. Technical literature is available from Commercial Filters Corporation, 2 Main Street, Melrose, Massachusetts.

ITS NEW

NOVEMBER 1958

Cummins Appoints Reece Hatchitt



Reece Hatchitt

Appointment of Reece Hatchitt to the position of Director—International Operations of Cummins Engine Co., Inc. has been announced by R. E. Huthsteiner, President. In this new position Hatchitt will direct all functions of Cummins Diesel Export Corp., a wholly-owned subsidiary, and will explore possibilities of establishing additional Cummins manufacturing plants in overseas areas. Mr. Huthsteiner said the future of Cummins' international operations looks ex-

tremely promising and the appointment of Hatchitt was made to further strengthen and expand activity in the international market. Prior to joining Cummins, Hatchitt was with Dresser Industries, Inc., Dallas, where he served as director of foreign operations and president of Dresser's foreign subsidiary, Dresser, A. G., Zurich, Switzerland. Earlier, he held various responsible positions with Reid and Priest, legal firm in New York; American and Foreign Power Company; and the Southwest Research Institute in San Antonio, Texas, U. S. A. His experience with these firms has been largely on an international level, including resident assignments in Latin America and Europe. Mr. Hatchitt is a 1936 graduate of Dartmouth College and holds the LL.B. degree from the University of Michigan law school.

The World's Leading Manufacturers of FUEL INJECTION EQUIPMENT for Diesel Engines



Depots and
Service Agents
in over 100 Countries.



FUEL INJECTION EQUIPMENT DIVISION

of

LUCAS ELECTRICAL SERVICES, INC.

Head Office: 501 West 42nd Street, New York, N.Y.

Sales Office: 14820 Detroit Avenue, Cleveland 7, Ohio

West Coast: 5025-29 W. Jefferson Blvd., Los Angeles 16, California

Branch Offices: 643 7th Street, San Francisco, California

4937 West Belmont Avenue, Chicago, Illinois

Canadian Distributors:

Joseph Lucas (Canada) Ltd., Head Office: 11 Davies Avenue, Toronto 8, Ontario

Branch Office: 3401 St. Antoine Street, Montreal 30, Quebec

AP 320

Bonney Adds 14 I-H Tractors

Bonney Motor Express, Inc., Norfolk, Va., carrier of specialized commodities, has added 14 International road tractors to its fleet as part of an equipment replacement program. Ten of the new units are diesel-powered model AC-225-D trucks as shown, and four are gasoline-powered R-205 models. The new Internationals join Bonney's fleet of 78 tractors and 78 refrigerated semi-trailers that serves points in 32 states along the Atlantic Seaboard and in the midwest. With daily service among its seven terminals, Bonney has authority to transport frozen foods, fresh and frozen meats, packing house products, dairy products,



candy, peanuts and canned goods. Its new International diesel trucks, rated at 68,000 pounds gross combination weight, have a low overall height that provides ample clearance of trailer refrigeration units. They are powered by Cummins NH-220 engines and have ten-speed RoadRanger transmissions and sliding fifth wheels. The R-205 tractors are equipped with 182 hp Red Diamond 450 engines. R. Lee Bonney, president of the firm, reported that his fleet traveled 7,500,000 miles last year while hauling more than 200,000,000 lbs. of cargo. Bonney Motor Express has been the recipient of many rewards for its enviable safety record.

470 HP Vitabella II



Vitabella II, one of the finest yachts built in recent years at Vancouver Shipyards Ltd., has just returned to her Vancouver dock following competition in the Capital to Capital race. The vessel was built by the Vancouver firm for G. D. Granville from designs by Thorton Grenfell, naval architect, Vancouver. *Vitabella II* is 52 ft. over all and has a 14 ft. 9 in. beam with a draft of 4 ft. This boat is powered with a pair of symmetrically arranged and opposite rotation Model 6087 and 6088, Series 71 General Motors diesel engines which develop 235 shp each at 2300 rpm. They are fitted with 2:1 Allison hydraulically operated reverse and reduction gears and turn 27x28, 3 blade Equipoise bronze propellers at 1150 rpm with 1 3/4 in. diameter monel shaft. The trim craft is exceptionally well equipped throughout and the G.M. diesel engines are fitted with 32

volt electric starting and 550 watt battery starting generators, as well as an ac alternator with shore lines connecting. Cooling is by closed circuit heat exchanger with temperature being controlled by thermostat. Each engine is fitted with full flow and bypass lubricating oil filter. On the front of one engine is driven a hydraulic pump for operation of the hydraulic anchor winch, and the front power take off on the other engine drives a continuously primed bilge pump. Controls are in the wheelhouse and the exhaust runs through 5 inch Maxim wet type silencer. The *Vitabella II* has a gross weight of 38000 lb. and an exceptionally low planing angle of 3 1/2° maximum. Trials were held in Vancouver Harbour and the *Vitabella II* was recorded a 22 knots maximum. HOFFARS Ltd. in Vancouver supplied the GM engines.

New Line of Gas Valves

Amot Controls Corp. has introduced a new line of diaphragm operated gas valves designated, model 2180. Besides its principle application as a gas valve on gas engines, this valve can also be used as a remote operated valve for starting air on both gas and diesel engines. The body of the new Amot valve is made of cast iron with working parts made of corrosion-resistant bronze and is equipped with 125 ASA flanges. The valve body is also available in cast steel with either 150 or 300 psi ASA flanges. The vent port may be plugged if desired and the maximum diaphragm operating pressure is 80 psi. This valve is designed to shut off fuel gas and vent the manifold. When pressure is applied to the diaphragm the vent port closes and the main ports open and admit fuel to the engine. When the pressure is released, a spring closes the main ports and the large ports vent the engine intake manifold which causes quick shutdown. When used with the Amot safety control, it provides automatic engine shutdown in case of high jacket water temperature, low oil pressure or other reasons. No adjustments are ever required. For further information write Amot Controls Corp., P. O. Box 1707, Richmond 1, Calif.

ITS NEW

Lubrication Alarm System By Manzel

A new protective device for use on force-feed lubricating systems has just been announced by Manzel, a division of Houdaille Industries, Inc. The new product, called the Lube-Line Alert, is installed at each terminal point of lubrication by simply cutting the line and connecting the fittings. The unit is then connected electrically to any desired audio, visual or mechanical warning device. If the flow of lubricant through the unit is interrupted for any reason, the signalling system is activated. This may be a bell, whistle, horn, master controlboard light or a relay to shut off the motor or ring a telephone. The standard Manzel Lube-Line Alert is usable with any viscosity oil or synthetic lubricant, and for pressures up to 10,000 psi. Explosion-proof units are also available for use where conditions require them. While Manzel is a manufacturer of force-feed lubricators, Sales Manager Robert W. Meyers points out that the Lube-Line Alert has universal application with any central lubricating system, and with any make of lubricator. He states that, "This unit

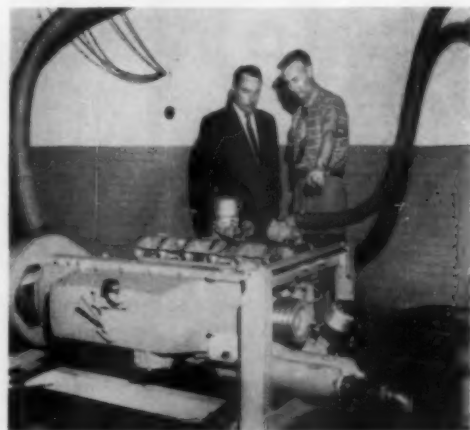


offers a low-cost method of providing positive protection to valuable compressors, engines and other machinery equipped with force-feed lubrication systems." Complete details on the Lube-Line Alert may be obtained from Manzel, 315 Babcock Street, Buffalo 10, New York.

ITS NEW

Hercules Producing Hall-Scott Engines at Canton

The first Hall-Scott engine manufactured by Hercules Motors Corp. at its Canton, Ohio, plant is inspected by William L. Pringle (left), Hercules' president, and M. W. Stoker, veteran Hall-Scott assembly foreman. Hercules acquired the Engine Division of Hall-Scott, Inc., on June 2 and the first engine came off the assembly line in Canton in late July. The first engine produced is a six cylinder 250 hp unit that will be delivered to Crown Coach Corp. of Los Angeles. It is a special bus engine of horizontal type construction that



permits it to be installed under the floor in the center of the bus. Since the acquisition by Hercules, more than two million pounds of parts, machine tools and tooling have been transported 2500 miles from Hall-Scott's Berkeley, Calif. plant to Hercules' plant in Canton. The shipment required 74 truckloads and 3 rail carloads and the entire move was completed in 30 working days. Production of Hall-Scott engines at the Hercules plant will increase daily until volume production is reached in September, according to Mr. Pringle.

ITS NEW



The case of the unused wrench

**How know-how and Cities Service Oil pay
off for Easton Utilities Commission**

Take five men with 111 years' experience in power plant operation . . . add Cities Service DC-300 Lube Oil . . . and you can retire the big overhaul wrench to the nearest rocking chair.

That's precisely what Easton Utilities Commission of Easton, Maryland has done!

Under the management of Supt. William Krumbine (41 yrs. experience) and his team of specialists, overhauls and maintenance problems have become a rarity.

Take the generator pictured above. Using Cities Service DC-300 Oil, they've had it operating 600 to 700 hours a month for over three years without losing a bearing or a piston . . . and without even changing oil! Oil is added, but never changed, thanks to its unusual stability and outstanding detergent-dispersant characteristics. Compression, fire pressure, and fuel economy are excellent.

If you're looking for a lube oil that can reduce friction, resist oxidation, and boost fuel economy, talk with a Cities Service Diesel Lubrication Engineer. Call the nearest office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



111 YEARS' COMBINED EXPERIENCE is shared by five men responsible for Easton's outstanding maintenance record. Sticklers for efficiency, they are unstinting in praise for Cities Service DC-300 Lube Oil.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Ostrander Promoted By General Metals



A. W. Ostrander

Arthur W. Ostrander has been elected Vice President for Sales by the Board of Directors of General Metals Corp., it was announced by William E. Butts, President. Mr. Ostrander's promotion to the top sales job in General Metals follows a successful job as Sales Manager of the Enterprise Engine and Machinery Co., a sales subsidiary of General Metals. He will continue to manage Enterprise sales. Initially he will launch a major sales effort for the General Metals foundry and forge division which operates plants in Oakland, Los Angeles, and Houston. Ostrander is a graduate of Dartmouth College and holds a Master of Commercial Science degree from Amos Tuck School, Dartmouth School of Business Administration. He was formerly Executive Vice President of American Farm Machinery Company, Minn., and before that, Vice President for Sales in the Farmhand Division of the Superior Separator Company at Hopkins, Minn.

New Diesel Fuel Filter

A completely new, small size, large area diesel filter is now available from the Fuel Injection Division of Hartford Machine Screw Company. The Roosa Master fuel filter is of simple construction consisting of only three main parts—the top, the element or body, and the base. The top serves as the filter



cover. It contains an air vent screw and directions for venting, draining and changing are clearly cast on the top. The base supports the element and contains the inlet and outlet passages. It is designed to include an adequate sump for the collection of water and sediment and has tapped holes in the bottom for mounting. The filter element is contained in a metal canister that also serves as the filter body. It is a unique spiral paper construction which provides a maximum filter surface area within minimum dimensions. Paper strips are cemented together at top and bottom to form a series of "V" shaped coils which are wound around a cylindrical core. This design provides about 560 sq. in. of filtering area, which is many times that of most filters of comparable size. When the element becomes choked it is readily replaced without requiring tools, and the cost is much less than the cost of replacing a complete throw-away filter assembly. To change the element the top is unscrewed by

hand and the element removed from the base without disconnecting fuel lines. As the element is removed, a spring loaded seal blocks off the passage leading to the injection pump preventing dirt from entering the line or fuel leaking from the pump. With a Roosa Master fuel filter assembly it is impossible to run the engine with the element removed, and the element must be re-assembled correctly to allow fuel to pass through it to the injection pump. Two or more filters can be mounted in parallel or in series using only a small space on the diesel engine.

ITS NEW

GM Bus Diesel Sets Company Record

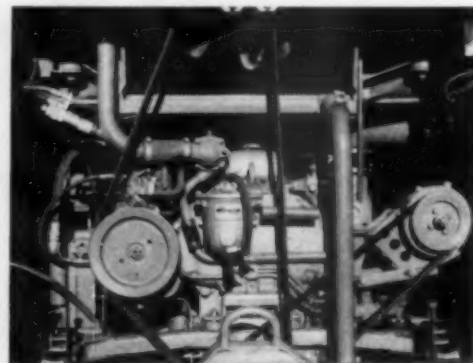
Illustrating the efficiency of Saskatchewan Transportation Company buses, a four cylinder engine, recently completed 306,193 miles without any major overhaul, setting a new Company record. According to R. D. Mahara, operations manager, it is a General Motors four-cylinder, two-cycle diesel, rated at 153 hp at 2,200 rpm and a high torque of 385 ft. lbs. at 1,600 rpm. This engine is one of several such units installed in company buses which have completed 275,000 miles or more without any major repair. Purchased in 1954 with 15 others, the engine is being stripped down for routine overhaul. Speaking from experience gained from other engines of this type stripped down in the past, Mahara said that in all probability the engine would only need rings, pistons and sleeves. The crankshaft has been measured and magnafluxed and found to be perfectly straight, without cracks, and journals and throws show no wear or taper. When re-assembled the engine should be good for another 300,000 miles or more. In its 306,000 miles of travelling, plus many more hours of idling in bus depots while loading passengers, the engine has been encased in the same bus and has outlasted 3½ sets of tires. It smashed a previous record set by an identical General Motors diesel by more than 25,000 miles.

Mr. Mahara said the performance of this engine was indicative of the all-round efficiency and safety of the Saskatchewan Transportation Company. "Naturally, when we select engines for use in our buses we have to keep in mind the excellent name of the Company, and engines are purchased to live up to this name. They must be reliable, rugged, economic and safe in order to meet our requirements. Since taking delivery of our first diesel units in 1946 we have found them excellent in meeting these conditions and we have been extremely satisfied with their performance" he



Photographed in the Legislative ground, this Saskatchewan Transportation Co. bus is powered with a General Motors four cylinder, two-cycle Diesel engine. The Courier 95 bus was built by Motor Coach Industries Ltd. of Winnipeg.

said. Mr. Mahara pointed out that it was of great importance that all mechanical equipment operates efficiently in order to maintain the Company's reputation for good service in Saskatchewan. "Our coaches give our fleet the latest in body structure engineering, safety features and comfort. Body framework is all tubular steel construction,



This record-breaking General Motors Diesel engine completed 306,193 miles without any major overhaul. The two-cycle engine is installed in a Courier 95 bus owned by Saskatchewan Transportation Company.

electrically welded, insulated with fibre glass and finished with aluminum alloy panels, all for safety and durability. Safety is one of the prime factors in all our equipment and this, along with courtesy, is stressed to the 58 drivers employed by the Saskatchewan Transportation Company, and drivers, like equipment, must be well qualified to meet these standards", he said.

He explained that any person applying for a job of driver must be not less than 24 years of age, must have some experience in driving, preferably heavy vehicles and must produce evidence that his past driving record is clear of preventable accidents. Rigid tests in visual acuity, reaction, distance judgment, field vision, night vision, glare resistance, steadiness, colour vision, strength and hearing must be met by the prospective driver. During his first week he is accompanied by a senior driver in order to familiarize himself with the various equipment and the routes in the division in which he will be working. This also gives the senior driver an opportunity to report on the new driver's ability to handle the vehicle, his attitude towards the passengers and his general overall ability to become an STC driver. To maintain the highest efficiency standards the Company works in co-operation with the National Safety Council, and issues safe driving awards to drivers with accident free records.

Prominent Engineer Dies

The diesel and allied power industries lost a great man when the death of Raymond A. Schakel was announced by Diamond Chain Co., Inc. Ray, as he was known to everyone, was Manager of the Sales Engineering Department of Diamond, which includes both automotive and diesel engineering. He joined Diamond in 1924 and spent his entire career in sales, the results of which have played an important part in the development of many of the markets for Diamond products. His death certainly is a keen loss, not only to Diamond, but to all his business and personal associates. Ray was a member of the ASME, SAE and the API organizations and took an active part in all three.

These engine users save money with Allis-Chalmers low maintenance...

**24 engines average over
5,000 hours before overhaul**

Allis-Chalmers engines in 24 trucks hauling ore at a large western copper mine average over 5,000 hours of operation before overhaul. Many have given more than 20,000 hours of service and are still "going strong."



**Has gone 7,000 to
8,000 hours since overhaul**

The Allis-Chalmers 6DC1879 in this Bucyrus-Erie dragline at an eastern plant has had but one overhaul since it was new in 1949, and has gone another 7,000 to 8,000 hours since then. It keeps a fleet of about 40 trucks moving at about 10-minute intervals.



BC-20

**No repairs
in 6,000 hours**

This Koehring dragline works 10 to 24 hours a day for its Louisiana owner. It is powered by an Allis-Chalmers 1879 that has had no repairing since it was new, over 6,000 hours. The operator reports, "I haven't had a minute of downtime."



...you can, too!

One reason Allis-Chalmers engines *earn* more, *save* more is because they are on the job *working* more of the time.

Their rugged, simple construction results in a minimum of maintenance. Parts are fewer and stronger — that means less wear, less that can go wrong.

"Clean," simple design naturally means easier servicing, too. And you are always close to fast parts and service, wherever you are. Result: Allis-Chalmers engines are back to work quickly. See your dealer for the full story of Allis-Chalmers' dependability and economy. Allis-Chalmers, Milwaukee 1, Wis.

ALLIS-CHALMERS
POWER FOR A GROWING WORLD



Florida Diesel News

By Ed Dennis

AT Pompano, the Farmers Manufacturing Co. took delivery of two General Motors dieselized G. & W. water pump units. One was powered with a GM 4-71 rated 112 hp and the other with a GM 6030C rated 142 at 1800 rpm. Both will be used for irrigation purposes on farms.

MATHIAS M. Antz has been appointed Regional Sales Manager for the Mercedes-Benz line of diesel engines by the Curtiss-Wright Corp. for the south eastern part of the U. S. and the Bahama Islands. He received his BS degree from the University of Arizona and graduated from the U. S. Merchant Marine Academy at Kings Point New York with an engineering degree.

TWO DW21 tractors and two 470 scrapers were delivered to Bransfield & White of Ojus and one to Linke-Smith. These are powered with 320 hp turbo-charged Caterpillar diesel engines. The 470 scrapers have a heaped capacity of 25 cu. yds. and were supplied by Shelley Tractor & Equipment Co.

WHAT is probably the greatest concentration of dieselized heavy duty construction equipment in Florida's history is currently working at Miami International Airport rushing the work for the opening which is scheduled for January 1st, 1959. Almost every type and name of equipment can be found working on the "Gateway to Latin America" airport.

AT Tampa, the Gulf Atlantic Engineering & Bridge Co., recently powered their hydraulic dredge with two DCSMR 2505, 8 cyl. Allis-Chalmers diesel engines each rated 516 hp at 1300 rpm. The diesels drive a 16 in. pump via 32 "V" belts from Twin Disc power take-off. The dredge also has several other Allis-Chalmers units for the generating set and the cutter head. Plans call for 15½ million yds. of sand to be pumped up; the diesels came from Gulf Coast Engine Sales of Tampa.

RYDER Truck Rentals recently added 74 International DCO280 hiway tractors to its fleet. Each is equipped with Cummins JT6B turbocharged diesel engine rated 175 hp at 2500 and Fuller R46 eight speed RoadRanger transmission. Ryder Tank Lines took delivery of eight B61 Mack diesel tractors to replace gasoline powered units.

THE 68 ft. *Cumberland* was hull #737 launched by Diesel Engine Sales of St. Augustine and the first shrimp trawler to be powered with the new General Motors 8-V-71 diesel, 311 max hp at

2300 rpm and 227 cont hp at 1800 rpm. It has a GM hydraulic 4.5:1 r&r gears and Hilco secondary lube oil filters.

AT Whale Cay in the Bahama Islands, Betty Carstairs recently repowered the 64 ft. inter-island cargo vessel *Cireuis* with a General Motors 6-71 165 hp diesel and 3:1 Twin Disc r&r gears to give the vessel more freight room. The is-

land itself has two 30 kw General Motors diesel 110/220 3 phase generating sets. The engines were supplied by Ellis Diesel Sales & Service of Fort Lauderdale (see Diesel Progress March 1956).

TWO 1030 kw Superior diesel generating sets were delivered to Blount Bro. Construction Co. to be installed at Santa Rosa Island. They will be used

as prime power in the guided missile program at that launching station.

BERTIE B, a 28 ft. fishing vessel of Miami was repowered from a gasoline engine to a 4 cyl. model X-220 Ford marine diesel engine, Paragon 1.5:1 r&r gears; marined by Modern Diesel Power Co. and sold by Southeast Diesel Marine Inc. of Miami.

Now 250 manufacturers —INCLUDING ALL THESE BUILDERS

OFF-HIGHWAY HAULERS AND CRANE CARRIERS



DITCHERS, GRADERS, ROLLERS AND STABILIZERS



PUMPS



EXCAVATORS, CRANES AND HOISTS



A 36 hp Mercedes-Benz diesel replaced a 25 hp gasoline engine in the 40 ft. ketch *America* owned by the Bagwell family of Tuscaloosa, Ala. and berthed at Fort Myers. The new model OM636 Mercedes-Benz is rated 36 hp at 3000 rpm.

Craggs Construction Co. of Ocala, received an Allis-Chalmers #45 motor

grader powered with an A-C 6 cyl. 120 hp diesel engine plus an A-C HD21 crawler tractor powered with a 225 hp turbocharged diesel and hydraulic torque converter drive from Square Deal Machinery Co. of Orlando.

RECENTLY launched at Chris Boat Yard, on the Miami River, the 45 ft. sportfisherman *Bravo* powered with two

4-71 inclined General Motors diesels and 2:1 Paragon r&r gears. These are rated 138 shaft hp at 2100 rpm and 94 shp at 1800 rpm.

CITY of Jacksonville repowered their General Electric yard switch locomotive with two model NHS-6-I Cummins diesel engines. These 4 cycle 6 cyl. 5 1/4 x 6 in. diesels are rated 290 hp at 2100 rpm

and came from Cummins Diesel Engines of Fla.

FIRST gulf shrimp vessel to be powered with a Burmeister & Wain Alpha diesel engine is the 70 ft. *Principe Enrique*. This 2 cycle 4 cyl. diesel develops 180 hp at 450 rpm and is directly connected to a 3 blade variable pitch propeller.

DIESEL Shipbuilding at Jacksonville built for Merritt-Chapman and Scott, a 40 ft. harbor utility vessel. The General Motors 6-110 diesel engine with 1.5:1 G. M. hydraulic r&r gears will be installed by the new owners.

I stopped recently at Kissimmee, the "Florida cattle capital" and viewed the 2100 hp Fairbanks-Morse diesel generating unit operating on bunker "C" fuel oil. This 1500 kw, 2400/4160 volt generating set uses Hilco hyflow oil filters and Woodward UG32 governors.

THE Fellows Motor Co. of Tampa will handle the Mercedes-Benz line of diesel engines for that area. Mann-Volumn-Gun, of Orlando, will be using the model ON321, rated 96 hp, for power in their irrigation line of equipment, to power Hale 3 and 4 in. water pumps on two wheel trailers.

UP at West Palm Beach, Fla. Georgia Tractor Co. delivered, to John Perdnell, a model H.O.D. Payloader tractor-shovel powered with a model JN6BI Cummins diesel and Allison torque converter.

AIR FORCE plans call for construction of a \$2,035,000 chain of instrumentation and missile tracking stations along Florida's West coast at Tarpon Springs, Marcos Island, Bonita Springs, Temple Terrace and Fort Lonesome. Almost all of these stations will have dieselized machinery as part of the equipment.

THE 42 ft. Kath-Cay, owned by Al Friedman of Fort Lauderdale, was repowered from gasoline to diesel with two General Motors 4-71 diesel engines with 1.5:1 r&r gears. With the 22x19, 3 bladed Equi-poise Federal propellers, it now makes 24 mph against 18 mph on gasoline and the fuel consumption dropped one half. Equipment supplied by Ellis Diesel Sales & Service of Fort Lauderdale.

HERE IS IMPORTANT INFORMATION! The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10 1/2" x 13 1/2", fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

offer "Jimmy" Diesel OF CONSTRUCTION EQUIPMENT

TRACTORS, SCRAPERS AND LOADERS



PETTIBONE



MICHIGAN

CURTISS-WRIGHT
SOUTH BEND DIVISION

AIR COMPRESSORS AND WELDERS



JOY



BLUE BRUTE



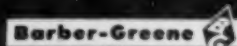
CRUSHERS, ASPHALT PLANTS AND PAVERS



Pioneer
EQUIPMENT



STANDARD



Registered trade marks are reproduced with permission of the manufacturers.

GM Diesel engines are available in more than 1800 different applications of power equipment

Contractors generally agree that engine standardization pays big dividends. The wide use of GM Diesel engines in more different makes of equipment than any other Diesel provides unequalled opportunities for standardization—and the fact

that GM Diesel covers the range from 30 to 893 H.P. with only 3 cylinder sizes results in highest parts interchangeability, lowest maintenance cost. Write for booklet, "STANDARDIZE YOUR POWER"—and learn the reasons why.

DETROIT DIESEL ENGINE DIVISION OF GENERAL MOTORS, Detroit 28, Michigan
In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario

IT PAYS TO STANDARDIZE ON...



Michigan-Ohio News

By Jim Brown

A \$2,816,370 dredging contract was awarded to the Western Contracting Corp. of Sioux City, Ia., recently by the Army's Corps of Engineers in Detroit as part of the overall 141 million dollar Great Lakes connecting channels project. The contract awarded to Western involves the dredging of 4,617,000 cu. yd. of material from Lake Nicolet in the St. Marys River near Sault Ste. Marie and entails approximately five miles of work.

EARTHMOVING, Inc. of Taylor Center, Mich. has recently purchased a model D LeTourneau-Westinghouse Tournapull from Telford Equipment Co. of Detroit. The new Tournapull is powered by a GM 4-71 Detroit Diesel engine and is rated a 7.3 yds. struck capacity.

NEW model TD-20 International crawl-

er equipped with hydraulic dozer blade was recently delivered to Flint Excavating Co. of Flint, Mich. The sale was made by Wolverine Tractor and Equipment Co. of Detroit.

WEISSMAN Excavating Co. of Detroit has accepted delivery on a model HD-11B Allis-Chalmers diesel tractor with hydraulic bulldozer blade. The tractor was purchased from Earle Equipment Co. of Detroit.

CYRIL J. Burke, Inc. has delivered a Northwest model 41 (1 yd.) combination pull shovel and dragline to Rocco Ferra of Detroit. The Northwest is powered with a Murphy model 12 diesel engine.

BERNICE A. Rohrbaugh of Canton, Ohio has recently purchased a model JT-6-B 175 hp Cummins diesel engine to power his Diamond T 660 truck. Sale was made by Cummins Diesel of Northern Ohio, Inc. in New Philadelphia, Ohio.

EDWARD T. Cook, Pontiac contractor, is the owner of the first Eimco tractor in Michigan. The Eimco is widely known and used throughout the western part of the United States. With the recent appointment of Maren-Fader Equipment Co. in Detroit and The Fader Equipment Co., Kalamazoo, as state-wide distributors for the Eimco line, added sales emphasis will be aimed at the mid-western market. The Eimco 105 tractor dozer is known for the "up-front" position of the operator, giving him a wide field of vision.

AUSTIN-Western Super 99 Grader equipped with torque converter and powered by a GM 4-71 Detroit Diesel engine was recently sold to the Ann Arbor Construction Co. of Ann Arbor, Mich. The sale was made by the R. G. Moeller Co. of Detroit.

COREY & Hartwig of Hadley, Mich. are using a new model TD-24 International crawler equipped with hydraulic bulldozer blade. The crawler was purchased from Wolverine Tractor and Equipment Co. of Detroit and Grand Rapids and will be broken in on a highway construction project near Utica, Mich.

JOE Bayak of Baldwin, Mich. has a new "long-track" model HD6E Allis-Chalmers crawler. The crawler was purchased from Earle Equipment Co. of Detroit.

U. S. Bureau of Public Roads reports indicate Michigan ranked sixth among the states in work placed under contract on the National Interstate System of Defense Highways during the first six months of 1958. Federal figures credited Michigan with placing \$29 million in work under contract on the system, covering some 37 miles of expressway.

LISLE Keefer of Norwalk, Ohio has purchased a 175 hp model JT-6-B Cummins diesel engine to power his IH model R-200 truck. The sale was made by Cummins Diesel Michigan Inc., of Dearborn.

EISENHOWER Construction Co. of Lansing, Mich. has accepted delivery on a model 250 Pettibone (3 1/4 yd.) front-end loader for use in their paving operations. The loader was purchased from Cyril J. Burke, Inc. of Detroit and is powered by a GM 4-71 Detroit Diesel engine.

GALION model 118 motor grader powered with an International model UD 525 diesel engine was recently purchased from Wolverine Tractor and Equipment Co. by the City of Southfield in Michigan.

GEORGE Cummins & Son of Detroit

have accepted delivery on an Allis-Chalmers model HD6E crawler tractor. The new tractor was purchased from Earle Equipment Co. of Detroit.

VICTOR Hill, of Roseville, Mich. has purchased a 190 hp model HRF-6-B Cummins diesel engine for his GMC model 740 truck. The sale was made by Cummins Diesel Michigan, Inc. of Dearborn.

ACME Equipment Co. of Detroit has been appointed representative of the Browning Manufacturing Co. of San Antonio, Tex., W. H. Gard, Acme president announced. Browning manufactures self-propelled, pneumatic tired, vibrating and sheepfoot rollers and 50 ton compactors.

ANDERSON Excavating Co. of Lansing, Mich. has accepted delivery on a model 30-B Bucyrus-Erie crane powered by a model UD 525 International diesel engine. The sale was made by Wolverine Tractor and Equipment Co. of Detroit and Grand Rapids.

ANN Arbor Construction Company of Ann Arbor, Mich. has purchased an Allis Chalmers model HD6G Tractor-Loader from Earle Equipment Co. of Detroit.

HILLIARD Drilling Co., Mt. Pleasant, Mich. has purchased two 320 hp Cummins model NHRS-6-BI diesel engines for their Franks rotary drill. The sale was made by Cummins Diesel Michigan, Inc. of Dearborn.

Purolator Announces Appointments

James D. Abeles, president, Purolator Products, Inc., Rahway, N.J., announced two new appointments in line with the company's plans to broaden the scope of customer service and application research. Jules Kovacs, vice-president, has been placed in charge of technical sales, and H. C. Mouwen has been named manager of the Research & Development Department. A company vice-president in charge of research and development since 1950, Kovacs' new position includes expanded responsibilities for new product marketing and special engineering services, while Mouwen will be responsible for new product development in filtration and separation.

HERE IS IMPORTANT INFORMATION! The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10 1/2" x 13 1/2", fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

at last!

a low cost, small size large area filter

Solve your installation problem with just one ROOSA MASTER fuel filter assembly with paper element filter. Only 6" high, 3 1/2" in diameter, it takes less space on your engine. No tools required, no fuel lines to disconnect and only 1" clearance needed when changing element ... and it costs less than throw-away filter assemblies. Write for information.

HMS

ROOSA MASTER

makes good diesels better

HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
DIVISION OF STANDARD SCREW COMPANY



Unique spiral paper construction provides 560 square inches filtering area.

YOU CAN DEPEND ON THE DIESEL THAT DEPENDS ON ROOSA MASTER

Mid-West Diesel News

By L. H. Houck

CAMERON & Joyce Const. Co., Keokuk, Ia., which has a 7 mile grading contract on U.S. 50 between Sedalia and Kansas City, placed a new Unit crane in service with a 6-71 GM diesel power plant.

FOUR No. 923 Diamond T's to Bob Norton, grain hauler, Sioux City, Ia., powered with 180 hp Cummins. Transmissions are 5A650 Fuller and driving axles are Eaton 18803, 2 speed. Dealer was Jerry Wilson, Sioux City.

FENIX & Scisson Construction Co., Tulsa, bought two Allis-Chalmers units from Chiles, Springfield. An HD6G Tracto-Shovel went to its job at Fullerton, Ky., and an HD6G to Middletown, Ohio.

AN Allis-Chalmers HD11B with dozer to John Bradshaw, Houston, Mo., from Chiles, Springfield, Mo.

KANSAS City Public Service Co., has received permission to abandon its last electric street cars and the lines will be equipped with new GM busses with 6-71 GM diesels and Allison torque converters.

POWELL Truck Lines, Springfield, Mo., which converted most of its fleet to diesel, has been sold to T.I.M.E., Lubbock, Texas, and all remaining gasoline units will be replaced with diesels. Powell's fleet uses International R-200 tractors, Cummins engines and R-46 Fuller RoadRanger transmissions. T. I. M.E. uses White's with Cummins.

TWO Allis-Chalmers HD6G's, Tracto-Shovels, to Burke Construction Co., Springfield, Mo., from Chiles, local dealers.

PAIR of Cummins 450 hp LRT-6-I diesels to Continental Oil Co., Cortez, Colo., for an Emsco G-500 rig, from Cummins Sales & Service, Inc., Fort Worth.

VILLARD Machine Co., Milwaukee, bought a 220 hp NH-6 Cummins to power an air compressor from Cummins Diesel of Wisconsin, Inc.

PAIR of Allis-Chalmers 45 motor graders to Gillioz Construction Co., Monett, Mo., from Chiles at Springfield, Mo. Units use the Allis-Chalmers diesel.

WILLIAM Edwards, Indianapolis, has repowered a GMC 740 truck with a Cummins 190 hp HRF from Cummins Diesel Michigan, Inc., Dearborn, Mich.

DEALERS report high interest in the

new Koehring Scooper, the new 2 yd. loader, full revolving, free swinging. Area dealers are A. F. Deany Co., Inc., Indianapolis; Allied Construction Equip. Co., St. Louis; Gil Boers Equipment Co., Chicago and Wisner, Inc., Rockford and Rock Island, Ill. Unit moves up to 400 tons per hour with a 70 hp diesel.

LIST & Clark, contractor on an interstate highway project in Kansas involving 1 1/4 million cu-yds. of excavation placed three Euclid TS-24 Twin-Power scrapers on the job. This unit has a GM 6-110 in front and a 6-71 GM diesel in the rear.

ACME Stone Co., Inc., uses two 150 kw Murphy diesel generator sets to power all the units of their rock plants except the rolls, now producing aggregate for Tennessee 57 relocation. Headquarters is Liberty, Tenn.

PATTEN Tractor & Equipment Co., Bellwood, Ill., Caterpillar dealer, is celebrating its silver anniversary this year. Other equipment distributed includes Athey, Hyster, Rome, Fleco.

W. T. CUTCHIN & Associates, Dyersburg, Tenn., highway contractors, now use a fleet of three LeTourneau-Westinghouse model D scrapers, Caterpillar DW 15 scraper, Allis-Chalmers 260 scraper and an Allis-Chalmers Hd20 tractor as a push loader.

AN Allis-Chalmers HD6E with dozer to Bill Tidwell, Ava, Mo., for contracting and road work, from Chiles, Springfield, Mo.

TO Tony Fanetti & Sons, Bloomer, Wis., a 175 hp Cummins JT-6-B for repowering an International DCO 195, from Cummins Diesel Sales, Inc., St. Paul.

UNION Construction Co., Kansas City, added an HD6 Allis-Chalmers Tracto Shovel to its spread on the Sedalia, widening and paving job on U.S. 50.

PAUL Bowman, St. Louis, has repowered a White 3000 with a 175 hp JT-6-B from Cummins Diesel Sales Corp., St. Louis, Mo.

Ross Publishes New Brochure

Just published, a new illustrated brochure describes the men, facilities and products of American-Standard, Ross Heat Exchanger Division. Titled, This is Ross—Ready for You, the publication shows how Ross puts primary emphasis on engineering in its exclusive role as a heat transfer specialist. Numerous illustrations demonstrate the broad range of applications for Ross equipment in practically every industry. Picture strips

highlight the modern engineering and fabricating facilities in the newly-built Ross plant devoted completely to large surface condensers and specially engineered exchangers. Photos also show the original plant where smaller, standardized units are mass produced. Ross is said to produce industry's most complete line of heat transfer equipment. Copies of brochure can be obtained from American-Standard, Ross Heat Exchanger Division, Buffalo 5, New York.

New Spark Plug-Pressure Indicator

Just introduced by Kistler Instrument Corp., the new SLM spark plug-pressure gage combination provides continuous, accurate measurements of compression and firing pressures in internal combustion engines. There is no modification of the combustion chamber, or use of special spark plugs that may alter the combustion process. Rugged enough to withstand and indicate detonation and

other destructive types of abnormal combustion, this unique indicator offers advanced instrumentation for engineering evaluation, production test, field maintenance, and fuel octane rating on both slow and high speed internal combustion engines. Based on a new and unusual design approach, the Kistler combination employs a separate subminiature quartz gage mounted in any standard spark plug. The radius of the body of the plug is increased less than .020 in. Because of the two-unit construction, damaged or fouled plugs can be easily replaced.

Changes in pressure or pressure rate generate an electrical charge which is displayed on an oscilloscope screen. One indicator does both. Calibration is by conventional static methods. For complete information on the spark plug-pressure gage combination, request Bulletin PPI-106. Write Kistler Instrument Corp., 15 Webster St., North Tonawanda, New York.

ITS NEW

Models from
40 to 400 h.p.
Gas or Diesel

Harbormaster . . . a complete, easily installed, marine power and steering package

Harbormaster Outboard Propulsion and Steering Units are complete marine power packages, ready for immediate use. Everything is included . . . fuel tank, battery, steering mechanism, even the hold-down bolts. Mount, put in fuel, start, and you're off with exceptional power and maneuverability.

Harbormasters are rugged, powerful . . . highly maneuverable . . . and have wide application in shallow or deep water, for coastwise service as well as in harbors, lakes, canals, and rivers. They give you operational and economical features not found in ordinary marine power.

What can Harbormaster Outboard Propulsion and Steering do for you?

If you need easily installed power, better steering control, safety in shallow water, easier maintenance, more efficient performance, simpler hull design, more cargo space, bigger payloads, or simplified crew operation . . . Harbormaster is your answer.

Send for your copy of big catalog containing detailed information and photos showing the benefits of Harbormaster Outboard Propulsion and Steering.

MURRAY & TREGURTHA, INC.
QUINCY 71, MASSACHUSETTS

MURRAY & TREGURTHA, INC.

6 Hancock St., Quincy 71, Mass.

Please send me New Catalog giving details and showing many photos of Harbormasters in action.

Name.....

Company.....

Address.....

Inland River Reports

By A. D. Burroughs

NEW combination tug-towboat, owned by Hannah Inland Waterways Corp., Lemont Ill., has been christened the *Margaret M. Hannah*. Built by Sturgeon Bay (Wis.) Shipbuilding & Dry Dock Corp., the 84 x 24 ft. twin-screw craft

has a rated 1000 hp from two Caterpillar engines.

AT Missouri Valley Steel Inc., Leavenworth, Kan., finishing touches went on the first of two dredge tenders for Western Contracting Corp., Sioux City, Ia. The 65 x 22 ft. twin-screw tenders will carry two GM (Cleveland) model 8-268A engines developing 500 hp each.

MERRITT-Chapman and Scott Corp. received delivery of another recent Diesel Shipbuilding Co. product, a new 41 ft. personnel boat, the *Contest*. A GM (Detroit) 6-110 provides main engine power.

AT Ingalls' Decatur, Ala., yard on the Tennessee River, two 146 ft. towboats are underway for the Argentine govern-

ment. Two 500 hp Caterpillar engines will be installed on each vessel.

A 560 hp Fairbanks-Morse engine will provide the main propulsion power for a new tanker, the *Bangor Socony*. Now under construction at Ingalls for owner Standard Oil Company of New York, the tanker will have a 42,000 gal. fuel capacity for fueling service in the New York Harbor.

TENNESSEE River has a newcomer, a 53 x 16 ft. towboat, *J. E. Potter*, owned by Tennessee Valley Sand & Gravel Co., Sheffield, Ala. Built by Barbour Metal Boat Works, St. Louis, the craft has two D-337-F Caterpillar engines rated at 200 hp each.

ETTA KELCE, the new 90 x 26 ft. twin-screw towboat, was getting the final checkover at St. Louis Shipbuilding and Steel Co., before delivery to Mid-America Transportation Co. The craft has Fairbanks-Morse engines for main push power, with Western Gear reverse-reduction gears.

STATE of Arkansas has placed an order for a 41 x 12 ft. pushboat with Barbour Metal Boat Works, St. Louis. The craft is to have a rated 115 hp from a D13000 Caterpillar engine for service on Norfolk Lake.

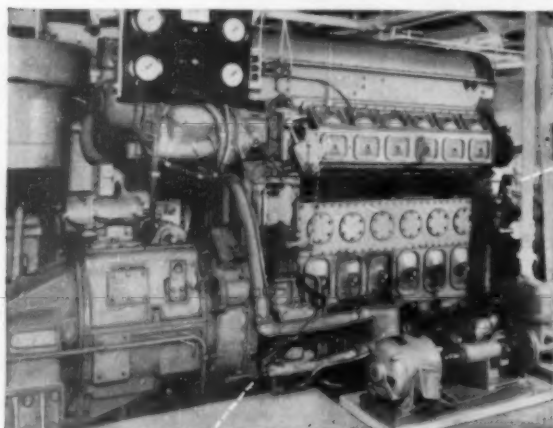
NEW 50 x 17 ft. towboat, the *Mark*, completed by Missouri Valley Steel, Inc., is at work for owner Massman Construction Co., Kansas City, Mo., with power from two GM (Detroit) engines, rated at 170 hp at 1800 rpm.

STRIBLING Bros. Corp., Greenwood, Miss., furnished two 650 hp Caterpillar engines for the new 75 x 24 ft. towboat launched at Lake Ferguson. The unnamed craft marks the 31st towboat constructed by Greenville Barge and Construction, Inc.

TWIN to the *William S. Lyon*, a 1956 towboat powered with two General Motors engines, is well underway at Greenville Manufacturing Co. The all-steel hull for the unnamed 100 x 30 ft. craft will become the newest for the Superior Towing Co., work fleet.

ST. LOUIS Shipbuilding & Steel Co., celebrates its 25th anniversary with the completion of the biggest towboat for any inland shipyard, the *United States*. The \$1,600,000 vessel, with 8500 hp from four Cooper-Bessemer engines, has christening ceremonies scheduled for October.

ACTION on the Upper Ohio included the big tows handled by the ORC's *Walter C. Beckjord*, with Baldwin-Lima-Hamilton power used for 19,800 tons



*
Fairbanks-Morse
Marine O-P Diesels
Help Make the
605 Ton Pure Oil
M/V R.B. Kelly...

"One of the Most Flexible Pieces of Floating Equipment Ever Built!"

—so says the president of Equitable Equipment Company who built this rugged, multipurpose craft in 1955.

The R. B. Kelly is serving as cargo ship, supply vessel, A-1 water carrier, tug boat, or operational barge serving offshore installations of the Pure Oil Company in the Gulf of Mexico.

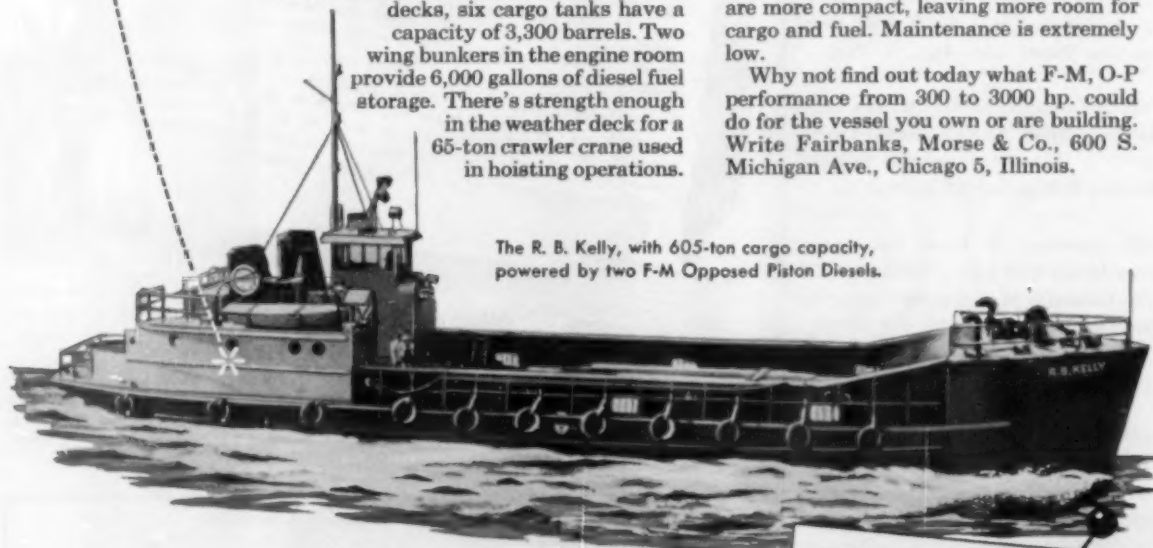
The Kelly can carry 10,000 feet of 9 5/8" O.D. casing at a single loading. Below decks, six cargo tanks have a capacity of 3,300 barrels. Two wing bunkers in the engine room provide 6,000 gallons of diesel fuel storage. There's strength enough in the weather deck for a 65-ton crawler crane used in hoisting operations.

The R. B. Kelly is powered by two, 6-cylinder 38F5-1/4 Fairbanks-Morse opposed piston diesel engines. Each one is rated at 450 hp. at 1200 rpm. Together the engines afford a line pull of 25,000 lbs. Her maximum speed is 12 1/2 knots.

More and more vessels today in all waters are turning to F-M Opposed-Piston Diesels as the finest source of power and economical operation available. They are more compact, leaving more room for cargo and fuel. Maintenance is extremely low.

Why not find out today what F-M, O-P performance from 300 to 3000 hp. could do for the vessel you own or are building. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Illinois.

The R. B. Kelly, with 605-ton cargo capacity, powered by two F-M Opposed Piston Diesels.



FAIRBANKS-MORSE
a name worth remembering when you want the BEST

DIESEL AND DUAL FUEL ENGINES
DIESEL LOCOMOTIVES • RAIL CARS
ELECTRICAL MACHINERY • PUMPS
SCALES • HOME WATER SERVICE
EQUIPMENT • MAGNETOS

of coal, plus 23 tons of steel in 25 loads.

FLAGSHIP of Seley Power Inc., the new *Theresa Seley*, put its 4200 hp from Nordberg engines to handle 15 huge barges loaded with alumina.

THE *Hamilton*, a popular compact, yet commodious towboat built by St. Louis Ship, operated by Canal Barge, has joined our photo collection. The 128 x 25 ft. Illinois waterway craft has 2560 hp developed from a pair of Enterprise engines.

ANDREW B., towboat owned by Cumberland River Sand and Gravel Co., still piles high the handsome performance record with 1400 hp from White's Superior supercharged engines.

IMPROVED service for operators in the upper Mississippi River system and on the Great Lakes is provided by a new, fully-equipped propeller shop that Dravo Corp. has added to its Neville Island marine repair facilities. The new shop is designed to handle the reconditioning of all types and sizes of both river and lake boat propellers.

West Coast News

By James Joseph

SOLD to Snohomish County Road District #3, Washington, a GM 3-71 fan-flywheel diesel engine for installation in a model 125A Michigan front end loader.

TO Los Angeles' Dept. of Water and Power, a Cummins VT-12 to power a pumping unit. Sale by Cummins Service and Sales, Los Angeles.

PACIFIC Intermountain Express has taken delivery of a Cummins NH-220 to power a Peterbilt rig operating out of Los Angeles.

DELIVERED to San Diego's James Cowan, a Fairbanks-Morse model 45B3-1/4 5 1/4 hp basic diesel engine.

FOR J. S. Barrett's boat *Gypsy*, Santa Ana, Calif., a GM 62200 RA main propulsion engine, swinging 50x41, 3-bladed wheel thru 4.5:1 reduction. Vessel does 12 knots.

LOS ANGELES' W. H. Moran has powered his boat *Serena* with a GM 3071-A swinging a 25x17 wheel using 2:1 reduction. Sale by Crofton Diesel Engine Co. Inc.

DOUGLAS Aircraft's new DC-8 jetliner is installed with an AiResearch air turbine starter. An integrally contained fuel air combustor begins the starting

cycle by supplying pneumatic power to the air turbine. Turbine starts one engine and bleed air from this engine operates air turbine starters in the three other jet engines.

TO Olympia, Washington's F. E. Wilder, two GM 4-71s and a GM 2-71 (20 kw AC generator set) for the 65-ft. cruiser *Saluda III*.

FOR Hazel-H Charters, Westport, Wash., a GM 6-71 turbocharged marine diesel (300 hp at 250 continuous) for 42 ft. charter boat *Hazel H*, built by Kazulin Cole Shipbuilding Corp., Tacoma, Wash. Sale by Evans Engine and Equipment Co., Inc., Seattle.

FOR an Autocar DC, Ogden, Utah's Slot Brothers has purchased a Cummins

NT-600 diesel engine, via Cummins Intermountain Diesel Sales Co., Salt Lake City.

TO Alaska Tug & Barge Co., for its *Alaska Queen*, a GM 24003.

LOS ANGELES Harbor Dept. has taken delivery of a GM 3061-A 30 kw generator set for the tug *Angels Gate*.

WINSLOW Full-Flow FILTERS

Case History Report No. 35 Shows Why Engines

Protected By WINSLOW FILTERS Last Longer



MORE THAN 15,000
HOURS WITHOUT ENGINE
REPAIR

Fuel Filtration

Central Texas Gravel Company further protects its powered equipment by Winslow Fuel Filters, which remove moisture, acid, dirt and other impurities from fuel oil, to protect working parts and improve engine performance.

Only Winslow Filters offer CP* Protection

Winslow patented CP* (Controlled Pressure) elements are designed to continuously self-adjust the pressure within the filter and allow for a full stream of filtered oil without opening by-pass valves. This is accomplished through the dual flow capacity, with two types of material.

These two Euclids were put into service by Central Texas Gravel Company in April, 1950. Winslow full-flow filters were installed to replace the original equipment; after which, oil was changed every 120 hours, and elements every 180 hours, instead of at 60 hour intervals. Both Euclids have GMC diesel engines.

No engine repairs whatever were required until June, 1956. In a six-year period, the engines were operated more than 15,000 hours under severe weather and dirt conditions. In 1956, one engine was replaced and the other is still in operation, without overhaul.

Contrast this record of engine performance and life with that of your equipment. This is only one example of the important savings made by the use of Winslow Full-flow Filters. You can increase engine life and reduce maintenance costs with Winslow Filters—because they keep all the dirt, moisture and other contaminants out of your engines, under any conditions. Only Winslow CP* filters can give you this protection. Let us send you information on filters and elements for your equipment.

CP* is fully protected by patents and trademarks

WINSLOW

ENGINEERING & MANUFACTURING COMPANY

4069 Hollis Street, Oakland, California

W-2594-A

Diesels All Around

The World

By F. Hal Higgins

BLACKWELDER Manufacturing Co., which builds the Marbeet Harvester at Rio Vista, Calif., has brought out an attachment for saving the beet tops for live stock feed. Ernest Blackwelder reports that most of the company harvesters are being attached to diesel tractors this year. International, Case, Allis-Chalmers, Deere, Ford wheel diesels can be seen in the beet fields from Ohio to California. For the latter state, however, many use the bigger crawler diesels of International, Cat, Allis-Chalmers and Oliver.

FAIRBANKS, Morse & Co. is building a new type air compressor to produce liquid oxygen as fuel for guided missiles. This is a complete factory on wheels capable of being flown or driven to any

spot. A F-M 1200 hp opposed piston diesel drives the compressor through a Twin Disc PO-124 air clutch.

THE Australian Chamberlain has a new model on the market called the Countryman. The Meadows 4DC330 diesel engine of 60 drawbar hp powers it. This native tractor has stood the competition of British, German, Italian, French, and U.S. diesel tractors imported into Australia the past few years.

FRENCH government has 200 diesel tractors deployed on a program of rebuilding age-old farm lands that wind and water have ruined via ignorant farm practices and carving out new farm lands from hills by terracing. International crawlers are playing a big part in the land revolution to make Algeria self-supporting.

BRAZIL is getting nearly a quarter million acres of new farm lands by diesel-powered crawler tractors in the hands

of a private firm that has the contract to clear, plow and irrigate unused land covered by trees and brush. TD14s and TD18s are the tractors used by Empress de Mecanizacao Agricola. This fleet has worked on nearly 1400 different farms to clear and prepare any idle land wanted by a farmer. The efficiency of the diesel crawlers in the hands of good operators is spreading private tractor ownership among those farmers who hire such service.

HENRY Vanderwall had International TD9 diesel tractors flown into a wild area behind the Bitterroot Mountains of Idaho to build a landing field for airplanes recently. Men, equipment and the oilfield products for the equipment were all flown in by Johnson Flying Service. Tractors were re-assembled after flight. The 4100 ft. runway will be ready this summer and is expected to handle 1,000 flights during its first year of service.

REMOVING brush and converting it to grasslands is having a double value in increasing flow of water from springs and streams, says University of California School of Forestry researchers. Hundreds of thousands of acres of brush-covered desert, foothill and mountain lands will be cleared in the next few years by diesel-powered tractors with bulldozers, rippers, front rakes, etc. California Fish & Game Department, Sacramento, is interested.

SIX Allis-Chalmers HD-16 diesel tractors equipped with bulldozers are punching a new access road into a virgin timber stand in southern Washington. Hegewald Timber Company purchased 23 million board feet of timber from the Forest Service and bought the fleet of tractors for quick low cost road building. Road will become a permanent forest service when logging is completed.

AMERICAN mills manufacture 70 billion paper bags annually. A century ago, the paper bag was practically unknown. Everything came in bulk. Some of the companies in the industry use over a million cords of lumber a year, and diesel tractors, loaders, trucks and railroad locomotives are big factors in cost cutting and mass production of the timber from stump to consumer.

ROLLS Royce is manufacturing under license the Twin Disc torque converter that is being installed on the Vickers-Armstrong crawler tractor in England.

LOGGING in Paraguay has been given a modernistic lift by an Allis-Chalmers HD-11 diesel tractor that hitches onto a string of 10 to 12 ox-drawn logging carts to get them through the mud in rainy weather. Six oxen on one of these

native carts hauls about two tons in good going.

TERRA-TIRE tractor, manufactured by Atwood Vacuum Machine Company, Rockford, Ill., is being offered with a Continental ZD 129 diesel engine. Designed specifically for the United Fruit Company's banana plantations, it is finding customers with snow, ice, sand, wet grass and such difficult footing for standard wheel tractors. Its wheels wear the Goodyear 24 x 24 Terra-Tires which are like pillows with air pressures of 5 and 7 p.s.i. for front and rear respectively.

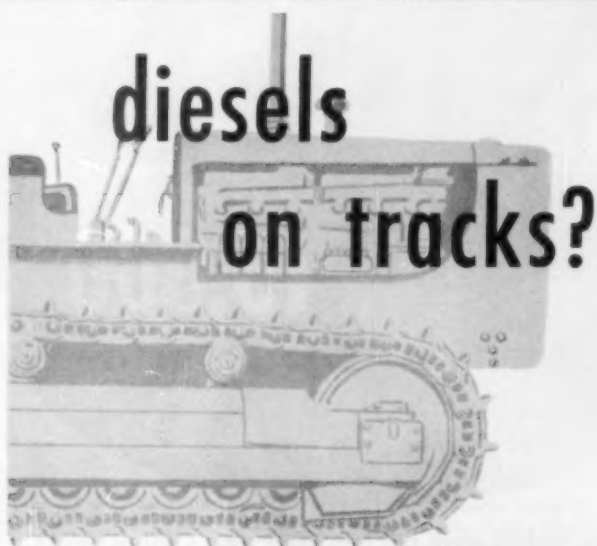
BIG diesel trucks are bringing pears down from both Oregon and Washington to the canneries in California this year to balance the shortage of this fruit crop in California as a result of late rains and hails that knocked off blossoms and scarred setting fruit in the Sacramento-Stockton area. Both Washington and Oregon, however, have bigger than normal crops. Hence, the big Peterbilts, Kenworth, GM, IHC and Mack trucks with Cummins, GM, Mack, P&H, Hercules and Waukesha diesels under the hood for the long runs of 400 to 1,000 miles from orchards to canneries.

CHEMICAL weed control returns \$4 for every dollar invested in the 11 Western states of the U.S., says Dr. Boyssie E. Day, plant pathologist at University of California Citrus Station at Riverside, Calif. Wheat growers now save \$40 millions annually in production costs by using the herbicide 2,4-D. For green peas another \$8 millions, sugar beets \$6 millions, hay \$4 millions, etc. Needless to say, the diesel tractor is the big power on the ground in all these western crops with International, Allis-Chalmers, Case, Cat, David Brown, Deere, Ford, Wagner, Minneapolis-Moline and Oliver tractors with their own and Cummins, GM, Waukesha, Hercules and Continental engines in some models.

DIESEL-powered fork-lift trucks were shown at the Western Packaging & Materials Handling Exposition at San Francisco Aug. 11-13, last. Towmotor of Cleveland powers both its straddle-bug Gerlinger and its conventional Towmotor with Continental diesels. Yale & Towne now has a factory at San Leandro, Calif. Both Hercules and GM diesels power its Trojan tractor shovels.

ALLIS-Chalmers announces a corn picker to match its new D-17 diesel tractor. It is a 2-row mounted with adjustable stripper plates that the operator can adjust by lever from the tractor seat.

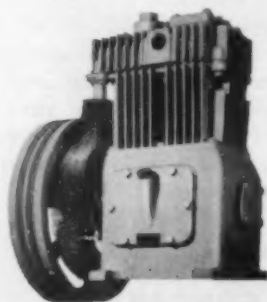
BOTH International Harvester and Deere & Co. have announced tractor-mounted shellers to go with their corn



another spot for Quincy compressors

A positively sealed, dust-proof crankcase is just one reason why Quincy Compressors take to this assignment.

They're rugged all the way through — with an improved pressure lubrication system that signals the operator if oil is low! Service from coast to coast — complete selection from 1 to 90 C.F.M.



WRITE FOR CATALOG TODAY

Quincy
COMPRESSORS

QUINCY COMPRESSOR CO. • Dept. DP-1158, QUINCY, ILL.

pickers. This combining two farm jobs for one tractor operator on a bigger diesel tractor than the traditional standard gas tractors of the Corn Belt is one of the big trends to cut costs and keep the farmer ahead of ever-rising labor costs that pile up in everything he buys.

THE "Four 99" is the name of Perkins' new light weight diesel for autos, trucks and vans. It is going through tests on taxis on London streets and has test runs in Australia that gave as high as 50 mpg at 35 mph.

MEXICO has a tough railroad building job that has a lot of diesel power helping cut costs and time from the Pacific port of Topolobampo to Laredo, Tex. A lot of hard rock construction in mountainous terrain has 20 Cat D8's cleaning up after blasting, four Manitowocs and one Bucyrus-Erie shovel, three Kochring dumptrucks, one Eimco 105 front-end loader, one Allis-Chalmers motor grader, 150 Atlas and Gardner-Denver rock drills, twenty Kochring Dumptrucks, twelve Euclid 80-Bs, seven Eimcos and fifteen Lincolns.

CULTIVATING and thinning of sugar beets in one tractor operation has been the growing trend this year all over Pacific Coast and mountain beet areas. International, Deere, Case, Allis-Chalmers, Ford, Minneapolis-Moline and David Brown diesels are gaining in all areas over the old gas tractors. Larger farms and all-time high wages are economic pressures making the change-over.

INTERNATIONAL diesel engines of the UD1091 model power the Schramm 600 Unistage and the model 1200 portable air compressors, announces Schramm, Inc.

HANOMAG-Hannover sends me specifications on its lines of wheel and crawler tractors and a truck and industrial power units. Rated diesel horsepower for the power units range from 10 to 75 for the D14J, D21J, D26J, D28LAJ, D57J and D93J. Their line of earth-moving crawler tractors includes two models—the K320E and the K565E. Frisch and Menck equipment in the way of bulldozers and angle dozers are available attachments. The Hanomag-diesel truck HA5400 is powered by the Hanomag D28 LA engine, a 4-cycle job.

HERE IS IMPORTANT INFORMATION! The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10½" x 13½", fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

NOVEMBER 1958

New Office Opened

G. M. Wallace & Co., representatives for Commercial Filters Corporation, announces the opening of a new office in the Electric Building, Suite 512, El Paso, Texas. The office is under the direction of Mr. B. M. Huffman, a mechanical engineering graduate of the University of Texas, who has had wide

experience in the application of engineered industrial equipment.

Free Piston Engines Featured

The September 1958 issue of Lubrication Magazine published by The Texas Company presents an excellent article on the complete development of Free Piston Engines, with particular empha-

sis on the design and operational features of the Sigma GS-34 gasifier. Applications of the free piston engine for stationary electrical power generation, marine propulsion, locomotive power and pumping and compressor drive is also presented as are future trends and outlook. Copies of the issue are free upon request to The Texas Company, 135 E. 42nd St., New York 17, N. Y.

New Cleveland Diesel-powered tug saves an hour through Hell Gate



IRVING T. BUSH, owned by the Bush Terminal Company and operated by the Bush Terminal Railroad Company, was built to the design of the Railroad General Managers Association of New York by Jakobson Shipyard, Oyster Bay, N. Y.

Bush Terminal Company's new tug, IRVING T. BUSH, makes a regular trip from Brooklyn, through Hell Gate, to the New York, New Haven and Hartford Railroad terminal at Oak Point, N. Y., in one hour less than the steam tugs she replaced.

No wonder President John C. Hilly says, "In the short time the IRVING T. BUSH has been in service, we know that we have increased the efficiency of our operation by 25%."

Her 1200-H.P. Model 567C General Motors Diesel engine, driving through a Wichita "controlled slip" clutch, provides these advantages: 1. Positive control of propeller speed throughout its entire range; 2. Smoother operation with single, remote lever control; 3. Quick response and 4. Sharply reduced maintenance cost.

You can count on top efficiency when you choose Cleveland Diesel power!

A GOOD PRODUCT PLUS GOOD SERVICE GIVES TOP PERFORMANCE

CLEVELAND DIESEL

Engine Division of General Motors • Cleveland 11, Ohio

SALES AND SERVICE OFFICES:

Chicago, Ill.	Houston, Texas	New York, N. Y.	Portland, Ore.	San Diego, Calif.	Seattle, Wash.
	New Orleans, La.	Pittsburgh, Pa.	St. Louis, Mo.	San Francisco, Calif.	Wilmington, Calif.

Kendavis Industries Formed

Widely expanded growth of 19 affiliated companies operating throughout the world recently resulted in formation of a new top-level international management organization known as Kendavis Industries, Inc., International. Officers and an advisory committee were announced at Fort Worth headquarters

by Ken W. Davis, President of the new corporation. "This twentieth organization reflects the growth of our 19 various companies and was set up to permit more efficient, economical management, resulting in better service to our industries," Davis said. Companies affiliated with the new organization include: Compania Pionera de Venezuela, C. A.; CP-Harrisburg, Inc.; Cummins Sales &

Service, Inc.; Cummins Sales & Service de Venezuela, C.A.; Dorris Ballew, Inc.; Great Western Drilling Company; six domestic and foreign organizations of the Loffland Brothers group, including Loffland Brothers Company; Loffland Brothers Company of Canada; Loffland Brothers Company of Venezuela; Loffland Brothers de Venezuela, C.A.; Loffland Brothers de Caracas, C.A.; and

Loffland Brothers Company of Peru; Mid-Continent Cummins Export Corporation; Mid-Continent Supply Co.; Mid-Continent Supply Co. of Venezuela, C. A.; Pioneer Well Services, Ltd.; Stratoflex, Inc.; Stratoflex of Canada, Inc.; and Unit Rig & Equipment Company.

Naval Architect Meeting

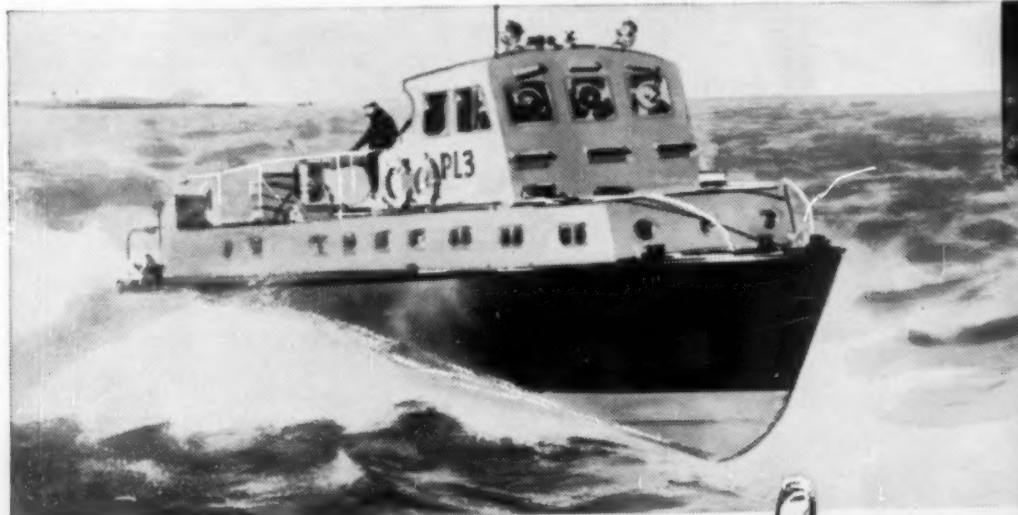
The 66th Annual Meeting of The Society of Naval Architects and Marine Engineers will be held in New York City at The Waldorf-Astoria on November 12 to 15, 1958. These annual meetings of the group have been the feature and culmination of each year's activities since the formation of the Society in 1893. The Council, governing body of the organization, will meet on Wednesday, November 12th. Technical sessions in the morning and afternoon of November 13 and 14 will follow, these being open to the entire membership and their guests. This year a program encompassing the presentation of eleven technical papers is being planned. The Annual Banquet, restricted to members only, will be held in the Grand Ballroom of The Waldorf-Astoria on the evening of Friday, November 14th. The Annual Dinner Dance for members and their guests will also be held in the Grand Ballroom, being scheduled for Saturday, November 15th. The meetings and banquet will be presided over by Walter L. Green, who was elected President of the Society for two years at the 1956 Annual Meeting. He is Chairman of the Board of the American Bureau of Shipping. A new President of the Society will be elected at these sessions, to take office on January 1, 1959.

Scrubber Bulletin Issued

A new technical data bulletin describing how the Centrifix WD Scrubber removes 99.5 per cent or more of all solid or liquid entrainment in gas or vapor is now being offered by Centrifix Corp. Included in this four-page brochure are cut-away views of both types of WD Scrubbers—one equipped with a spray ring, the other with an internal liquid feed—showing exactly how the contaminated gas or vapor is first scrubbed and then dried as it passes through this vessel with minimum pressure drop. Its operation is described in detail, together with the five design variations that make possible the many different applications of this equipment in petroleum refineries, food packers and canneries, gas processing and transmission, manufacture of drugs and pharmaceuticals, steam generation, boilers, incinerators, steel mills, chemical processing, etc. For a copy of this WD Scrubber Bulletin #500, write to Centrifix Corp., 3608 Payne Ave., Cleveland 14, Ohio.

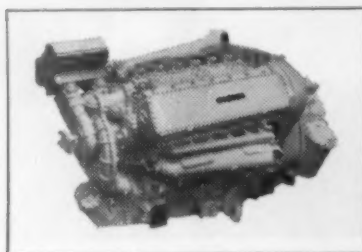
ITS NEW

DIESEL PROGRESS



'RIGHT ON SCHEDULE!'

—with **NAPIER DELTIC** power



Napier Deltic 18-cyl. opposed piston, 2-stroke diesel marine power unit.

Deltics—Napier-engineered, high speed diesels—reduce shore-to-rig crew transportation times by 50% and more.

Deltics pack a bigger punch into a smaller space than any other marine engine—they are 25% the size of conventional diesel units.

Deltics can cruise a 50-passenger launch at 35 m.p.h. with a comfortable reserve of power in hand.

For fast, reliable, low-maintenance marine transportation, Deltics—9 or 18 cylinders—can be integrated into your design calculations. For more information contact **NAPIER ENGINES INC.**, 909 Dupont Circle Building, Washington 6, D.C. Telephone: North 7-0146.

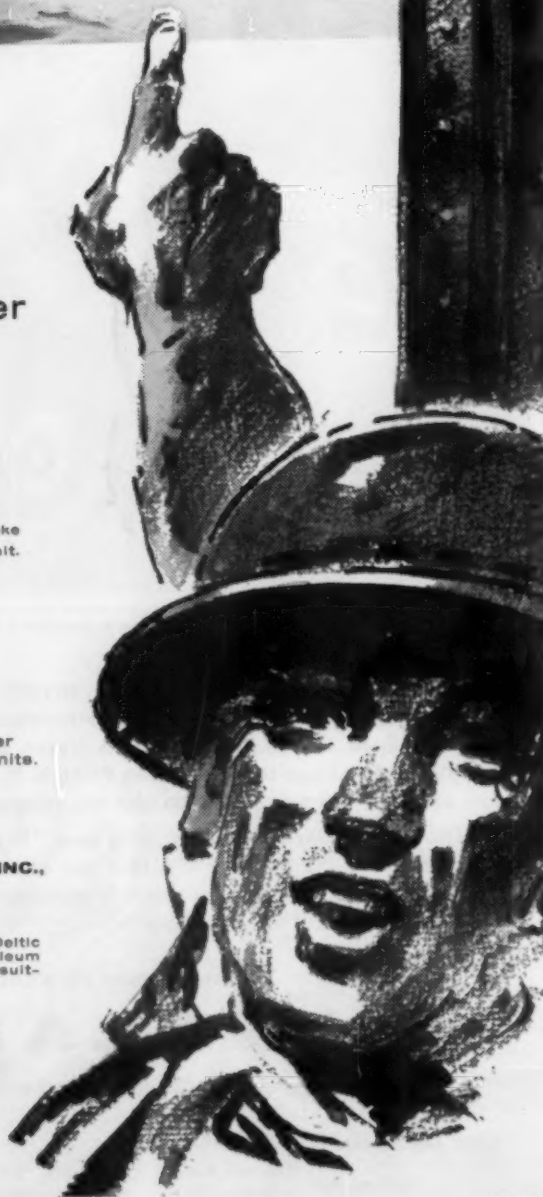
The boat illustrated is one of the fleet of Thornycroft-built, twin Deltic powered, 50-passenger crew launches operated by the Shell Petroleum Company on Lake Maracaibo. Plans of Deltic powered crew boats suitable for Gulf operation are available.

NAPIER **Deltic** marine diesel

FOR THE MOST POWER IN THE LEAST SPACE

D. NAPIER & SON LIMITED · LONDON W.3 · ENGLAND

Partners In Progress with The ENGLISH ELECTRIC Company Ltd.



CRC D36

1958 DEMA Standard Practices

The Diesel Engine Manufacturers Association has announced publication of the 1958 Diesel Standard Practices for low and medium speed diesel and gas engines. This 220 page book is fully illustrated with pictures, charts and diagrams and contains 20 chapters on engine construction, rating, selection, installation, fueling, lubrication, cooling, performance and operation. The new book is the work of an outstanding committee of engineers whose everyday work in the factory and in the field qualifies them to write authoritatively on the various subjects. The new Standard Practices supersedes on previous editions and copies may be obtained at \$5.00 each from the Diesel Engine Manufacturers Association, 2000 K St., N.W., Washington 6, D. C.

ITS NEW

New Brochure By Detroit Diesel

A 12-page illustrated brochure entitled, There is a difference in Diesels, has just been released by the Detroit Diesel Engine Division of General Motors. Covered are topics such as diesel vs. gasoline engines, the difference in 2-cycle and 4-cycle engines, fuel systems, parts interchangeability, service and others. It includes information on fuel to assist diesel engine owners and operators in selecting the type of fuel that will result in the most satisfactory operation of their engine. Copies of the brochure may be obtained from Detroit Diesel distributors or dealers or by writing the Detroit Diesel Engine Division, General Motors Corporation, Detroit 28, Mich.

Freytag Named To Cooper-Bessemer Post

Appointment of Guillermo Freytag as Branch Manager of its Mexico City office is announced by Charles G. Cooper, President of The Cooper-Bessemer International Corp. In his new capacity Freytag will have direction of the application and sale of Cooper-Bessemer compressors and engines in Mexico. Mr. Freytag replaces Jorge Flores Munoz who has resigned as Cooper-Bessemer International representative in Mexico to manage his fishing enterprises in Mazatlan. The field office from which Freytag will base his activities is located at Melchor Ocampo 469-602, Mexico 5, D.F., Mexico.

Expansion Joint Division Formed

Flexonics Corp. has formed an Expansion Joint Division, the second of five operating divisions being established under a new organizational plan recently announced. E. L. Hiter has been named General Manager of the new division. He will be responsible for both production and sales of all expansion joint and compensator products.

Mr. Hiter was previously expansion joint Sales Manager. Key members of the staff for the new division are: R. L. Benton, Division Factory Manager, J. E. Isenhardt, Division Accounting and Office Manager and R. M. Quick, Assistant Division Sales Manager. Headquarters of the division will be located at Flexonics' Savanna, Ill. plant.

Fairbanks Morse Awarded Contract

Fairbanks, Morse & Company was awarded a \$988,001 contract by the U. S. Army Engineers, Jacksonville, Fla. for furnishing the diesel pumping equipment for a new pump station in the giant Central & Southern Florida Flood Control Project. The terms of the contract call for four horizontal pumps each having a capacity to pump 1040 cu. ft. per second complete with transmission systems, backflow control gates and gate hoists. In addition to the pumps the contract calls for four diesel engines for driving the pumps, four sets of auxiliary diesel engines, spare parts for the various units and four chain transmission units.

Service on Norfolk and Western shows:

AIR-MAZE OIL BATH FILTERS GIVE LONG POWER ASSEMBLY LIFE

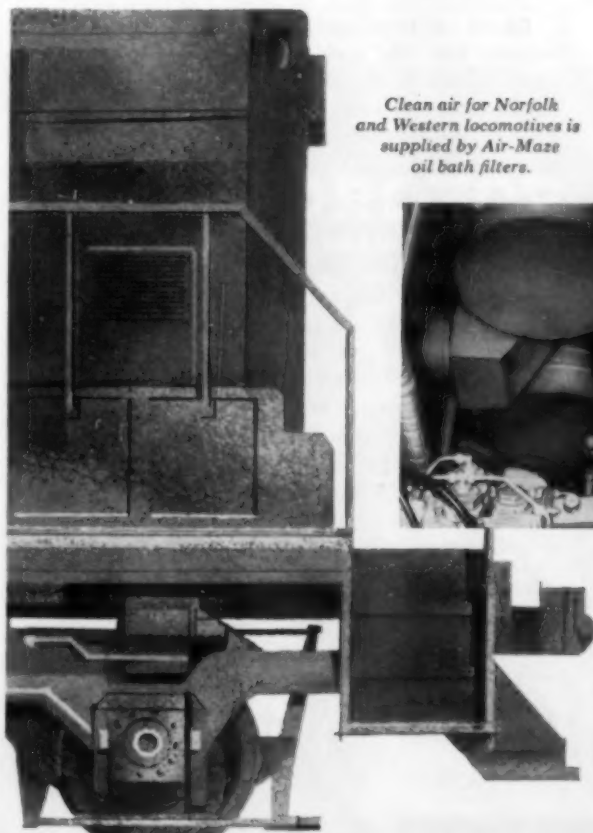
The first Air-Maze oil bath filter installed on the air intake of a Norfolk and Western 1800 hp Alco diesel locomotive equipped with the Model 251 engine was placed in service in 1956. 140 N & W locomotives are now equipped with Air-Maze oil bath filters.

The reasons for using Air-Maze filters are clear. After two years of heavy freight service, one of the 1800 hp locomotives was brought into the Roanoke Shop for inspection. This is what the inspection showed:

1. Pistons and rings in excellent condition. Ring and groove wear minimum. Rings free, none broken or bald. Crowns of pistons clean with normal buildup.
2. Chrome-plated cylinder liners showed negligible wear.

As a result of this inspection, overhaul period has been appreciably extended. Maintenance calls for draining and refilling oil bath filter every 90 days, cleaning annually.

For details, contact your locomotive builder or the Air-Maze Corporation, Cleveland 28, Ohio. Dept. DP-11.



Clean air for Norfolk and Western locomotives is supplied by Air-Maze oil bath filters.

The biggest names in diesels
are protected by Air-Maze filters

AIR-MAZE
The Filter Engineers

ENGINE AIR FILTERS • CAR BODY FILTERS • LUBE OIL FILTERS • OIL SEPARATORS • PASSENGER CAR FILTERS

Marine Engine Bulletin

An attractive new catalog, Cummins Marine Diesels, has been released by the Cummins Engine Co., Inc. The catalog shows 24 engines in a horsepower range from 110 to 1,120, giving details on specifications and applications. Engine design features offered in the Cummins marine diesels include: large

exhaust and air passages, overhead valves, open-type combustion chamber, replaceable wet-type liners, cam ground pistons, and a precision machined crankshaft. The catalog provides complete explanations on the Cummins PT fuel system and Cummins turbodiesel engines and has a map of the Cummins distributor organization. Persons interested in the new Cummins marine cata-

log may obtain copies at their nearest Cummins distributor's office, or by writing to Cummins Engine Company, Inc., Columbus, Ind.

ITS NEW

Farrell Appointed District Manager

Appointment of Emmons L. Farrell as District Manager of the Minneapolis

Territory of the Engine Division is announced by R. W. Bayerlein, Divisional Vice President, Nordberg Manufacturing Company. Mr. Farrell will headquarter in the Division's new District Office, Suite 533, Metropolitan Building, Minneapolis. According to Bayerlein, the establishment of the Minneapolis office reflects the broadening of the Engine Division's sales program and will enable the company to better serve the utility, REA and industrial markets for diesel and gas engines. Mr. Farrell's territory includes Minnesota, greater Iowa, North and South Dakota, northern Wisconsin and the upper Michigan Peninsula. Formerly District Manager of the Milwaukee Territory, Farrell is a graduate of the Marquette University Engineering School with a B.S. degree in Mechanical Engineering. He joined Nordberg in 1943 and was named a Sales Engineer in 1949.

New Fuel Additive

After extensive field tests, a concentrated additive for diesel fuel is now being marketed nationally through accredited diesel parts and equipment jobbers. Power-Pal is a product of the Nutmeg Chemical Co., who for more than 20 years has specialized in the production of fuel oil additives for major industry. Power-Pal in field tests according to the manufacturer has proven itself capable of increasing the power and performance of diesel equipment. In transportation equipment, it reduces multi-shifting on grades. In specific fleet tests, there have been reports of a minimum of 5% savings in fuel. In marine equipment, or any equipment where moisture is a problem, Power-Pal is especially effective in combatting the build up of sludge in the tanks and keeps the pumps in clean and efficient operating condition. For further information write: The Nutmeg Chemical Co., Inc., 138 Haven Street, New Haven, Conn.

ITS NEW

Forgings Firm Changes Name

A new name has been chosen for National Forge & Ordnance Company, Irvine, Pennsylvania. Robert O. Wilder, president, announced that the company will be known as National Forge Company, effective immediately. "The change was made to more accurately reflect the wide variety of our industrial products," Wilder stated. "While National Forge Company continues to produce ordnance material, it constitutes a relatively small percentage of our production." Numerous additions in recent years to National Forge Company's plant equipment have broadened its production capabilities. These facilities now include basic electric melting furnaces, heat treating furnaces, and equipment for



To the Employee Relations Director of every American company

LET'S FACE IT . . . the threat of war and the atom bomb has become a real part of our life—and will be with us for years. Fires, tornadoes and other disasters, too, may strike without warning.

The very lives of your employees are at stake. Yours is a grave responsibility. Consider what may happen.

When the emergency comes, everybody's going to need help at the same time. It may be hours before outside aid reaches you. The best chance of survival for your workers—and the fastest way to get back into production—is to know what to do and be ready to do it. To be unprepared is to gamble with human lives. Disaster may happen TOMORROW. Insist that these simple precautions are taken TODAY:

☐ **Call your local Civil Defense Director.** He'll help you set up a plan for your offices and plant—a plan that's safer, because it's entirely integrated

with community Civil Defense action.

☐ **Check contents** and locations of first-aid kits. Be sure they're adequate and up to date. Here again, your CD Director can help—with advice on supplies needed for injuries due to blast, radiation, etc.

☐ **Encourage personnel** to attend Red Cross First Aid Training Courses.

☐ **Encourage your staff** and your community to have their homes prepared. Run ads in your plant paper, in local newspapers, over TV and radio, on bulletin boards. Your CD Director can show you ads that you can sponsor locally. Set the standard of preparedness in your plant city. There's no better way of building prestige and good employee relations—and no greater way of helping America.

Act now . . . check off these four simple points . . . before it's too late.



SPACE FOR THIS

CIVIL DEFENSE

MESSAGE CONTRIBUTED BY

By J. J. Adams



finish machining all forgings made by the company. National Forge Company produces crankshafts for diesel engines and gas compressors, molds for cast iron pipe, aircraft and missile parts, and heavy machinery components for more than 100 industries including mining, paper, cement, and steel.

Sanders Southwest District Manager

Appointment of C. Horace Sanders to the position of Southwest District Manager is announced by Grant C. Woodard, General Sales Manager of The Cooper-Bessemer Corp. In his new capacity, Sanders fills the post formerly held by A. A. Burrell, who is retiring after 33 years of active service with the company. Affiliated with Cooper-Bessemer since 1927, Sanders served in the company's Shreveport, La. office before joining the Dallas office in 1931. He was promoted to Assistant Southwest District Manager in 1946 and has capably served that position continuously until his recent elevation to Southwest District Manager, Woodard points out. The Dallas office of Cooper-Bessemer is located at 1318 Fidelity Union Life Building, Dallas 1, Tex.

Emergency Power For Missile Ships

Emergency power for the U. S. Navy's future fleet of 13 missile-launching destroyers will be supplied by diesel-powered generator sets manufactured by Hercules Motors Corp. Twenty-six 100 kw (DFXD) emergency generator sets—two for each destroyer—have been ordered from Hercules Motors. These generators will provide the sole source of light and power on each ship when regular power is interrupted, according to William L. Pringle, Hercules president. The keel for the first of the 13 new ships—the USS Henry B. Wilson (DDG7) has already been laid at DeFoe Shipbuilding Co., Bay City, Mich. Others will be built at DeFoe, Todd Shipbuilding, Bath Iron Works and N. Y. Shipbuilding. The destroyers will be equipped to launch Tartar surface-to-air missiles. Over-all length of each will be 440 ft., displacement 3370 tons. The vessels will carry a complement of 354 officers and men.

Philadelphia Branch Manager

Edward W. Robinson has been named branch manager of the Philadelphia region for the White Diesel Engine Division of the White Motor Co. He replaces former manager, J. P. Hill, who is retiring. The Philadelphia region includes eastern Pennsylvania, southern New Jersey, Delaware, and Maryland. Mr. Robinson is a familiar figure in

east coast marine circles, having served this area as vice president and manager of J. H. Mathis Company, shipbuilders in Camden, New Jersey, and as an applications engineer for another diesel manufacturer. Prior to that time he had been active in diesel engine sales with another firm and had spent four years apprenticeship in marine engineering. A member of the Society of

Naval Architects and Marine Engineers, Mr. Robinson will be headquartered at 232 Hemlock Road in Wynnewood, Pennsylvania.

Chemical Counteracts Exhaust Odors

Reduction of exhaust odors in diesel operated equipment is now simply and

economically feasible with Alamask DI-2K, a new odor-control additive developed by Rhodia Inc. According to the manufacturer, the new formula is now commercially available for bus, truck, train, industrial, marine, military, home-heating and farm use wherever diesel fuel combustion presents an odor problem to the community and workers. Cost is less than half a cent per gallon.

crank engines lightning fast—

with **OIL!**

- Sure, split-second starting—even in sub-zero weather
- Cranking power always available—even after months of idleness
- Safe: spark and explosion proof. Light in weight
- Low cost: saves battery, down-time and maintenance expense

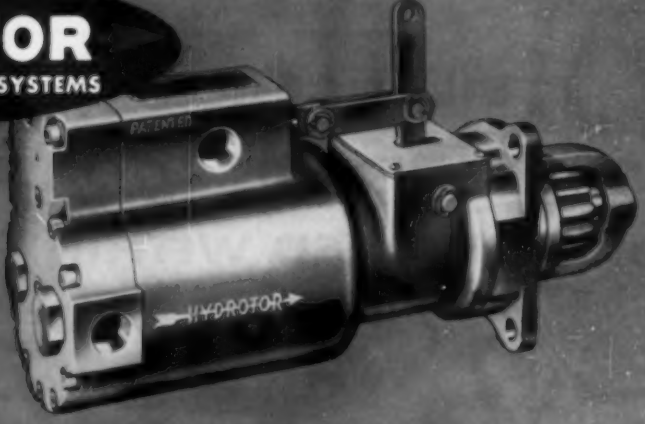
Here's a proved cranking system that spins engines 2 to 3 times faster—in torrid heat or freezing cold. It's the American Bosch HYDROTOR—the hydraulic cranking system that puts real muscle into engine cranking—eliminates battery and starter troubles, reduces down-time expense—saves you real money on maintenance and repairs. You'll want to learn more about HYDROTOR—the

revolutionary system that uses oil under high pressure to crank diesel or gasoline engines *faster with greater power*. You'll want the outstanding performance and dependability—the economy of HYDROTOR for your engines. Send today for free brochure H110-02-2 and the name of your nearest Hydrotor distributor. American Bosch Division, American Bosch Arma Corporation, Springfield, Mass.

6352

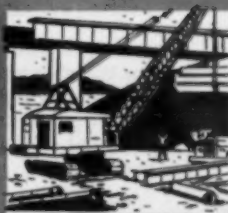
HYDROTOR

HYDRAULIC CRANKING SYSTEMS




HYDROTOR

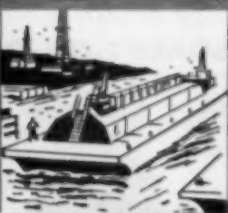
proved best by far for performance, for dependability, for low over-all cost.




FOR CONSTRUCTION



FOR TRUCKING



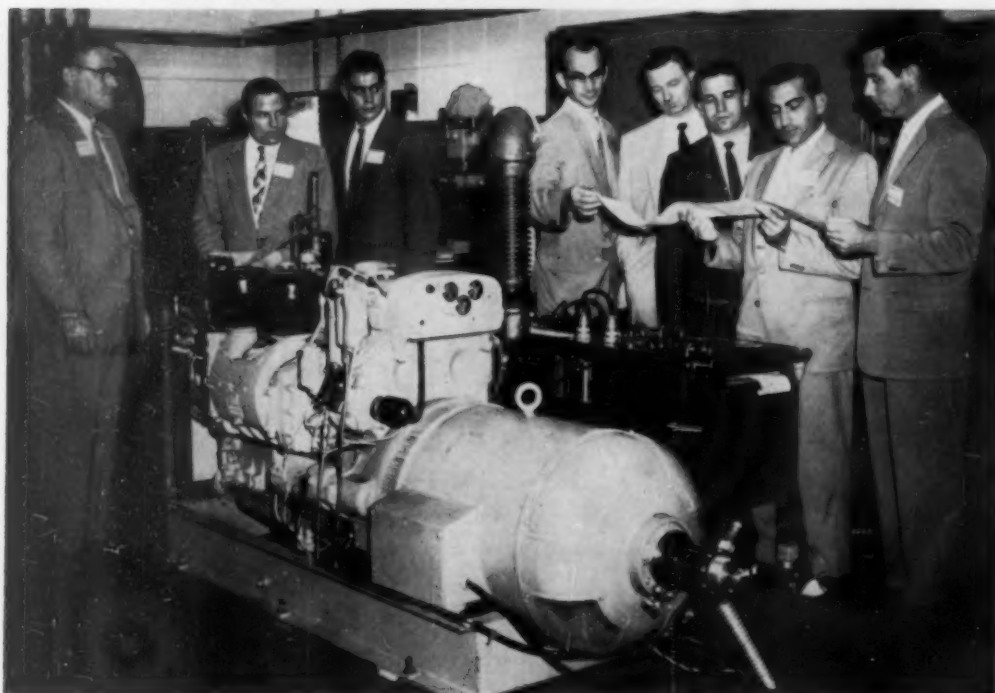
FOR MARINE USE



FOR OIL FIELDS

AMERICAN BOSCH ARMA CORPORATION

New Load Sensing Governor Highlights Prime Mover Control Conference



Shown here checking the results of a demonstration of an LSG governor are George Parker, Woodward; Bob Mudd, Allis Chalmers, Milwaukee, Wis.; P. A. Weiss, Fairbanks, Morse and Co., Beloit, Wis.; Bud Crittenden, Woodward; Lawrence C. Gordon, Navy Dept. Bureau of Ships, Washington, D.C.; Donald B. Dinger, Engineering Res. & Dev. Lab., Ft. Belvoir, Va.; Phillip J. Romanelli, U. S. N. Engr. Exp. Station, Annapolis, Md.; Edward A. Baker, Engineering Research & Dev., Ft. Belvoir, Va.

More than 150 visitors representing over 70 domestic and foreign companies were in attendance at Woodward Governor Company's 22nd Prime

Mover Control Conference, Sept. 2 through 5. Each year engineers and technicians come to the Woodward plant in Rockford, Ill. to attend this

conference, the world's largest single source of technical information on hydraulic governor applications. The conference is open to all foreign and domestic industries using hydraulic governors in their own operations as well as interested branches of the U.S. and Foreign governments. Theory, construction, applications and operating procedures of the new Woodward type LSG load and speed sensing governor was one of the important highlights of this year's conference. The new LSG limits offspeed due to load changes to an extremely small value on any particular engine. It causes proportional division of load between paralleled units with isochronous control. Without adjustment, system frequency remains constant regardless of load on a generating plant (within the limits of its capacity, of course). Steady state speed control is excellent. While a portion of the governor system (the load sensing) is electric, it retains all of the safety, reliability and convenience of operation that has always characterized Woodward governors. The electric load sensing improves and can't hinder. The engine is under complete speed governor control and protection at all times including starting and during emergencies or failures, such as loss of generator excitation, single phase or three phase short circuits, or damage to, or failure of, any internal or external part of the load sensing circuitry. If, due to accident or carelessness, electrical trouble does occur in the governing system or elsewhere, it isn't necessary to shut down the engine and send for a governor service man. The speed governor will continue to control the engine with a high degree of precision and safety.

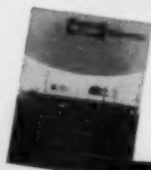
SILENCERS AND SPARK ARRESTORS

SHIPPED WITHIN


4 days

AFTER RECEIPT OF ORDER

Standard or special models. All sizes and types for every industrial, mobile and marine use, intake or exhaust. Write for helpful 24-page catalog on choosing silencers and spark arrestors.



*15 years
experience
in silence,
exclusively!*

Kittell

Kittell Muffler & Engineering, Inc.

1977 BLAKE AVENUE • LOS ANGELES 39, CALIFORNIA

DIESEL ENGINE CATALOG

The purpose of this little advertisement is to tell you about Volume 23 of DIESEL ENGINE CATALOG which is now available, entirely revised and rewritten. This is the 23rd edition of the book that has earned the name of "the bible of the industry."

All smart diesel engine salesmen carry this book around in their car. When they run into some new competition with which they are not too familiar, the DIESEL ENGINE CATALOG gives them full, accurate information when they need it most.

The consulting engineer keeps this book in his reference file. It immediately gives him all data on diesel engines coming within a given horsepower range, speed range and weight range.

People who sell, people who buy, people who use diesel engines need this new, fully illustrated, up-to-the-minute volume. It has been completely revised and expanded. Orders are now being accepted for this latest edition. Price \$10.00 prepaid.

Add California Sales Tax for Delivery in That State

DIESEL PROGRESS

816 NO. LA CIENEGA

LOS ANGELES 46, CALIFORNIA

GM Powered Ole

The *Ole*, a 67 ft. shrimp trawler, was hull #725 built by Diesel Engine Sales of St. Augustine, Fla. It will be fished by Ocean Products of Tampa in the waters of the Gulf of Mexico. Measuring 67 ft. in length with a beam of 18½ ft. and a draft of 6½ ft., the *Ole* is powered with a 210 hp General Motors 6-110 diesel engine driving a 50x44 four blade Columbian propeller through GM 4.5:1 hydraulic reduction gears. The Florida Branch of Detroit Diesel Division supplied the main engine. A 1500 watt Petter diesel engine auxiliary generating unit is also included in the engine room along with four 8 volt Yocam marine batteries. Gross tonnage is 63 tons with a fish hold capacity of 30 tons. Fuel oil capacity is 6000 gallons.



The 67 ft. *Ole* owned by Ocean Products of Tampa on her trial runs on the San Sebastian River.

New President at Stratoflex



C. A. Thomas

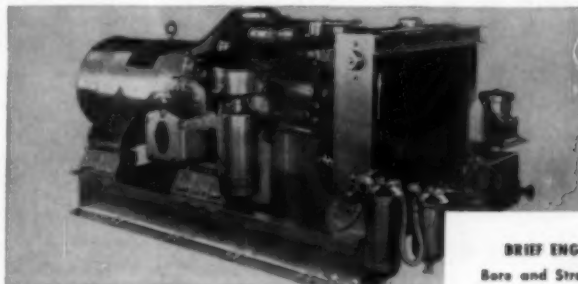
Mr. C. A. Thomas has been named President of Stratoflex, Inc., manufacturer of fittings and hose assemblies, with headquarters at Fort Worth, according to an announcement by Ken W. Davis, former President and now Chairman of the Board. Formerly Vice President of Sales, Thomas has been with the Stratoflex organization since 1953. Previously, he was connected with Mid-Continent Supply Co. John Tullis, formerly with Unit Rig & Equipment Company of Tulsa, is the new Vice President and General Manager of Stratoflex, Inc. W. E. Strittmatter is Secretary-Treasurer, Byron Scarborough is Assistant Secretary, B. L. Coontz is Assistant Secretary, and W. B. Hague is Assistant Treasurer. Ben Matheson, New York Representative, has been named Sales Manager. Warren Harry is the new Division Manager of the Fort Wayne, Indiana, plant; and W. D. Rothell is Division Manager at Los Angeles.

HERE IS IMPORTANT INFORMATION! The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10½" x 13½", fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

NOVEMBER 1958

WITTE MODEL 100RDA

This powerful, compact, diesel engine-generator unit is setting outstanding performance records in maintaining either low (-10°F) or high (70°F) temperature in 50' mechanically refrigerated railway cars.



Write for complete information...

Witte Engine Works
Oil Well Supply Division of
United States Steel



1615 Oakland Ave.—Kansas City 26, Mo.

A Diesel Engine-Generator Unit 12KW (Continuous)—1800 RPM

Many other uses are being found for the Witte 100 Engine, which powers this unit. Its low profile (30") makes it desirable in either stationary or mobile applications. Its two horizontally opposed cylinders provide an unusually smooth, vibration-free unit. The 100 Engine is built for continuous 24-hour-a-day operation and is outstanding in heavy-duty industrial applications.

BRIEF ENGINE SPECIFICATIONS

Bore and Stroke	4" x 4"
Cycle	4
Displacement	100 cu. in.
Speed	1,800 rpm
Horsepower:	
Continuous	18 hp
Maximum (Base Engine)	22.7 hp
Height	30"
Width	39"
Length (Approx.)	66"

A FREE 8 PAGE BOOKLET . . .

SERVICE, MAINTENANCE AND PERIODS OF OVERHAUL ARE DIRECTLY RELATED TO OIL QUALITY

this booklet is an authoritative survey of factors that have direct bearing upon the difference between economical oil protection and maintenance . . . and costly, less practical methods that spell increased engine down-time.

SUBJECTS COVERED ARE:

- "LUBE OIL FUNCTION"
- "CONTAMINATION SOURCES"
- "METHODS USED TO TEST FOR AND CORRECT CONDITIONS THAT CONTRIBUTE TO HIGHER OPERATION COSTS."

Easy to read, short and contains all the data that can be applied in daily maintenance and service. Write for your copy now.



OIL FILTERS • FILTER/SEPARATORS

THE BRIGGS FILTRATION COMPANY, DEPT. 273, WASHINGTON 16, D. C.
Please send your booklet covering oil maintenance tests and procedures.

Name

Company

Address

THE MAINTENANCE IN SERVICE OF
LUBRICATING OIL QUALITY BY
• FILTERING
• CONTAMINATION
• REGENERATION



THE BRIGGS FILTRATION COMPANY



ASME Test Codes

Three new power test codes have been published by The American Society of Mechanical Engineers, the Society announced today. They cover fuels for diesel engines and heat generation, de-aerators and water-cooling equipment. The 84 page *Test Code for Diesel and Burner Fuels* contains methods for the

collection of samples and the determination of all physical and chemical properties for the value of liquid fuels when they are used to generate heat or power. Gasoline or other fuels used in spark ignition engines are not included, however. The Code contains a new feature—the introduction of each test method by a brief discussion of the significance of the test. The codes may be ordered,

separately or together, from: Order Department, The American Society of Mechanical Engineers, 29 West 39th Street, New York 18, New York. Prices are: Diesel and Burner Fuels, \$4.00; Deaerator Code, \$3.00; Atmospheric Water-Cooling Equipment Code, \$2.75.

Green Promoted At Koppers

Robert J. Green has been named manager of direct accounts for the piston ring and seal department, Koppers Company, Inc., Baltimore, Md., according to an announcement made by John A. Worthington, manager of the department. Mr. Green was formerly located in New York City as eastern district manager of Koppers Metal Products Division. In his new position, Green will be responsible for the administration of all sales accounts handled directly by the product department, Worthington said. Mr. Green's office will be located at Koppers South Baltimore plant which is also the headquarters of the piston ring and seal department.

Dynamometer Training Films

The Dynamometer Division of Clayton Manufacturing Company has announced the recent completion of two training films on the use of chassis dynamometers in automotive service shops. These are 35mm sound strip films that are educational, covering subjects such as engine analysis, transmission and drive line trouble shooting as well as the efficiency of chassis dynamometer for fast quality control tests. According to a spokesman for the department, these films are available to interested groups on a loan basis. If you want to borrow one or both of these films, simply make the request on company or organizational letterheads and send to Dynamometer Division, Clayton Manufacturing Company, Box 550, El Monte, Calif. **(ITS NEW)**

Gas Turbines Power Helicopter

First announced use of AiResearch gas turbine engines as prime movers was revealed to the public last month when McDonnell Aircraft's new utility cargo helicopter was demonstrated to ranking military authorities at Wright Field, Ohio. Power plant for the versatile model 120 helicopter consists of three AiResearch model GTC 85-35 compressor turbines mounted in parallel. Enthusiastically received by the top aviation authorities representing the Air Force, Army, Navy and Coast Guard, the craft can carry more than its own weight in payload with unobstructed cargo space. In the unique propulsion system developed by McDonnell engineers after seven years of experimentation, compressed air from the AiResearch turbines is ducted through the rotor as-

sembly and blade spars to pressure jet burners located on each of the three rotor blade tips. Here fuel is injected and burning takes place giving the craft its propulsion. Directional control is accomplished by directing the turbine exhaust air against rudders operated by foot pedals. Advantages of the unconventional system include minimum vibration, inherent deicing and the elimination of: a tail rotor, ground resonance, blade tracking, reduction gears and shafting. AiResearch turbines are completely automatic, self-contained engines which need no warm up; all can be started in two minutes merely by flipping three switches, and individual engines can be replaced in five minutes time with no special tools. The copter can fly with only two engines giving multiple engine reliability. The engines are built by The Garrett Corporation's AiResearch Manufacturing Division.

Appointments By Alco

Alco Products, Inc. has announced two new assignments to its West Coast sales and service operations and a new appointment to its New York area sales staff. T. E. Fryar, former assistant renewal parts manager at the company's Los Angeles warehouse, has been named renewal parts and warehouse manager at Los Angeles. James L. Layton, former transportation products sales representative in New York, has taken over a similar position in the Los Angeles sales office, and Robert G. Koob has succeeded Layton in New York from his post as service manager in the district.

Glascok Joins White Diesel

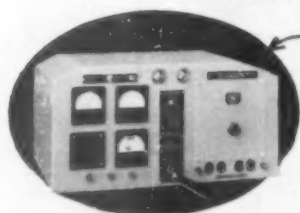
Edward H. Glascok has joined the White Diesel Engine division of the White Motor Company as sales representative in the New Orleans region, which includes Louisiana, southern Arkansas, Mississippi, and Alabama. Mr. Glascok will be responsible for sales to the oil field, marine, industrial, and municipal markets and at the service of area consulting engineers. His offices will be at 1038 National Bank of Commerce Building, New Orleans.

West Point, Nebraska To Add 1250 kw Unit

A Nordberg 1250 kw, four-cycle Dualfuel engine has been purchased by the City of West Point, Nebraska for municipal power plant improvement. The Supair thermal engine is scheduled for delivery in early 1959. It will have eight cylinders of 13½ in. bore and 16½ in. stroke and will be rated 1765 hp at 450 rpm. With the addition of this second Nordberg engine, plant capacity will be increased to 4425 hp.

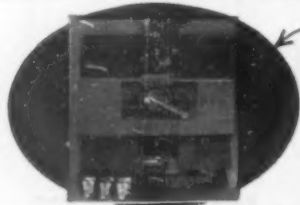
UNIT CONTROLS PACKAGE SYSTEMS

These new Lake Shore Electric developments give you the dependability and economy of simplified design... with the ruggedness and added convenience of standard components, and NEMA-type housing when specified



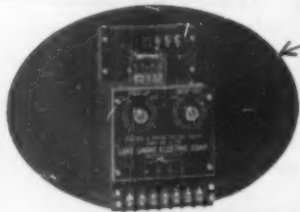
diesel generator control cabinets

Precision AC or DC controls... fully instrumented for trouble-free service. In top-mount, wall-mount, floor-mount cabs to 600 volts 50-60 cycle AC, 250 volts DC.



trans-o-matic transfer switch

This compact safety transfer switch is of mechanically-linked dual circuit breaker design which permits no neutral position. Full relay protection. To 4000 amps, 600 volts.



differential sensing relays voltage — current — frequency

Here's transistor accuracy and printed circuit ruggedness. Adjustable pick-up and drop-out between 70% and 100% of value with only two screw-type adjustments and standard plug-in relay.



autostatic voltage regulator

This rugged transistor design voltage regulator contains no moving parts to cause trouble. Highly accurate and low-cost. Fully warranted for one year. For single generator or parallel service.

where continuous light and power are vital... specify

THE

Lake Shore

ELECTRIC CORPORATION

207 WILLIS STREET / BEDFORD, OHIO

Southwest Diesel

Notes

By Don Taylor

H. B. ZACHRY Co., San Antonio, Tex. has taken delivery of a 175 hp JT-600 Cummins engine from Cummins Sales & Service, Inc. San Antonio. The engine will be used to repower one of the company's truck tractors. Zachry is one of the leading industrial contractors in pipeline and highway construction.

H. L. CHOATE, oilfield hauling contractor of Alice, Tex. purchased a 175 hp Cummins JT-600 diesel engine from Cummins Sales & Service, Inc. of San Antonio to replace a gasoline engine in a large oilfield truck.

SEACAT Drilling Co. of Turkey placed orders for four Stewart & Stevenson Model 6 GD-75C generator sets through its Dallas, Tex. office. These 75 kw generators are powered by General Motors Series 71, 6 cylinder model 6030C diesel engines.

ZERO Refrigerated Lines of San Antonio, Tex. has repowered one of its perishable commodities transport trucks with an NHB-220 Cummins diesel engine, purchased from Cummins Sales & Service of San Antonio. The engine replaces an NHB-600 Cummins engine in a model Cabover Kenworth H-54 truck.

OIL field hauling to the tune of a Cummins diesel engine, NHB-220 (220 hp). H. L. Choate, oilfield hauling contractor of Alice, Tex. replaced the NHB-600 Cummins diesel in one of his West Coast International Harvester trucks with a NHB-220 supplied him by Cummins Sales & Service Inc. of San Antonio.

BROWN & Root, S A, the South American subsidiary of the widespread Houston contracting firm has purchased one explosion resistant 5 kw generator set manufactured by Stewart & Stevenson Services, Inc. This P D-5, ac set is powered by the English-made Petter two cylinder air-cooled diesel, model AVA-2 which has about 10 hp.

CHICAGO Procurement Office of the U.S. Army Corps of Engineers took delivery of 48 Stewart & Stevenson Services, Inc. special 45 kw 400 cycle ac generator sets. The units will be used in the missile program. Power source: G M Series 71, 3 cylinder Model 3030C diesels.

CAPITOL Livestock Auction & Commission of Austin, Tex. purchased a

HRFB Cummins diesel engine for a 9000 White truck used in hauling cattle. The seller was Cummins Sales & Service, Inc. of San Antonio, Tex.

RAY Brent, produce hauler from McAllen, Tex. has purchased a Cummins NHB-220 to repower one of his trucks engaged in hauling produce from Texas' famed Rio Grande valley. Cummins Sales & Service, Inc. of San Antonio, Tex. made the sale.

H. L. CHOATE of Alice, Tex. purchased a Cummins HRB-600, 165 hp engine from Cummins Sales & Service, Inc. of San Antonio, to repower a DC 75 Autocar truck.

MATCHED, counter-rotating GM Series 71 diesels models 4087 and 4088 with inclined aluminum blocks were delivered to Gulf Refining Co. of Beaumont, Texas by Stewart & Stevenson Services Inc. of Houston, Tex. The engines will furnish twin power sources for a company boat; the weight savings of the light metal blocks, amounts to 300 lbs. per engine. Both engines are inclined away from the center-line to decrease height requirements.

MISSION Motor Lease, San Antonio, Tex. has repowered one of its rent trucks with a Cummins NHB-220 diesel engine purchased from Cummins Sales & Service Inc. The truck is a DCO-405 International Harvester.

A. E. HILLER, Eagle Pass, Texas contractor repowered a Super C LeTourneau Pull with a Cummins HI-600, 150 hp engine supplied him by Cummins Sales & Service of San Antonio, Tex.

SPRING Bros. Contractor of Batesville, Tex. purchased a 180 hp Cummins HRFB-600 engine for a model WB28 White truck from Cummins Sales & Service, Inc. of San Antonio, Tex.

IDECO, Inc.—a Dresser Industries subsidiary bought two GM Series 110 six cylinder closed type diesel engines, model 62406 for installation on a drilling rig being manufactured in the company's Beaumont, Tex. plant. Seller of the 300 hp engines was Stewart & Stevenson Services, Inc. of Houston.

DIESELS for hoists. E. L. Lester Co. of Houston took delivery of two GM Series 71, 3 cylinder model 3031C diesel engines which are rated at 75 to 85 hp. The engines will be used to power hoists which the company manufactures. Stewart & Stevenson Services, Inc. of Houston made the sale.

Governor Distributor Appointed

Farris Pickering Governor Co., of Palisades Park, New York, have expanded

their sales and service organization in the southern half of California by appointment of Diesel Control Corp., Wilmington, as their exclusive distributor. Pickering manufactures both hydraulic and mechanical type governors for speed regulation of gasoline, diesel and steam engines. To provide immediate service to users of Pickering Governors in the Southern California area, Diesel Con-

trol now has complete stocks of service parts and governors of the type used in the industrial and marine fields. Appointment of Diesel Control Corp., as Distributor will also bring to Pickering Governor users the extensive service and overhaul facilities of Diesel Control, including the availability of their Universal governor test stands for proving of governors.

it makes sense
ONE SOURCE
ONE RESPONSIBILITY
for all
DIESEL
COOLING
Requirements



ONE source, one responsibility for all cooling requirements is the sensible approach to solving heat transfer problems.

By using one reliable source, you automatically solve problems of service, and there is never a question of responsibility for performance. Young's wide range of products and over 30 years experience in designing, engineering and manufacturing heat transfer equipment for the diesel field qualifies them as the most logical source for all your cooling needs. Let us show you what undivided responsibility can mean in the way of economy, quality control and efficiency of performance. Write, wire or call without obligation.

YOUNG RADIATOR COMPANY RACINE, WISCONSIN

Acquaint yourself with Young's wide range of products for the diesel industry.

**MAIL COUPON TODAY
FOR FREE CATALOGS...**

Check the catalogs and literature you would like to receive. Mail coupon to Young Radiator Co., Racine, Wisconsin, Dept. 408-L.

- | | | |
|--|--|--|
| <input type="checkbox"/> Cat. No. 1632 — Young Supercharger Air Intercoolers | <input type="checkbox"/> Cat. No. 1356 — Young Jacket Water Coolers | <input type="checkbox"/> Cat. No. 357 — Horizontal Core Air Cooled Heat Exchangers |
| <input type="checkbox"/> Cat. No. 1258 and No. 1156 — Shell and Tube Heat Exchangers | <input type="checkbox"/> Cat. No. 1054A — Young Torque Converter Coolers | <input type="checkbox"/> Cat. No. 3558 — Type 'OH' Unit Oil Coolers |

Name

Company

Address

City

Zone

State

Panel Type Filter Developed For Railroad Diesels

An efficient filter for the removal of dirt particles from intake air on diesel locomotives has been developed by the Air-Maze Corp. Built specifically for railroad use, the filter is adaptable to existing vertical panel adapters on diesel engines. Providing dust arresting efficiencies in the area of 90 per cent, the new Panelbath provides filtration equal to or better than present panel filtration. Identified as Panelbath, the new dust removing unit incorporates principles of oil wetting and cleaning of media utilized on present Air-Maze oil-bath filters presently being used by over 4,000 diesel locomotives. Built for operating conditions varying from 400 to 1750 cfm, the Panelbath filter provides high dirt removing efficiency at maximum pressure drop of approximately 5 in. of water. Incorporating a self-cleaning filter action, dirt loading on the panel face is minimized to maintain low



Panelbath air filter developed by Air-Maze Corp. for filtering intake air to diesel locomotives.

pressure drop and assure adequate combustion air to the power cylinders. Designed for use where dust concentrations are moderate, the Panelbath railroad filter offers economy of installation on new and existing locomotive engines where first costs are a prime consideration. Since the filter mounts on conventional vertical panel adapters, installation involves the simple addition of four holding clamps. Under normal dust conditions, servicing of the filter involves periodic checking of oil level, occasional draining and filling of a 5 qt. reservoir. Conventional SAE 40 engine lube oil is used to wet and clean the filter media. In operation, intake air is drawn through the front grill and divided into two flows. One flow is directed to the media, the second flow is directed through an oil control trough, picking up oil droplets and carrying the droplets to the filter media, creating a

wetting action. The intake air entering the Panelbath deflects a calibrated baffle. At engine idle speeds the baffle is closed, insuring the required air to be deflected through the oil control trough. As the oil drains from the media, the oil carries impinged dirt particles to a sump at the bottom. The oil then returns to the reservoir where the circulation cycle is repeated. Air-Maze Corporation is located at 25000 Miles Road, Cleveland 28, Ohio.

(ITS NEW)

J. T. Calnon New President



J. T. Calnon

New President of Cummins Sales & Service, Inc., is J. T. Calnon, formerly Vice President-Sales for the Fort Worth firm. Ken W. Davis, former President, has been elected Chairman of the Board. Named Vice President and General Manager was L. J. Troutz, formerly General

Service Manager. Mr. Calnon began his service with Cummins Sales & Service, Inc., in 1945, advancing to Vice President in charge of sales in 1952. Troutz is Vice President of Cummins Sales & Service de Venezuela, C. A.

In the Southwest, Cummins Sales & Service, Inc., maintains 16 factory type maintenance shops and sales outlets located in Texas, Louisiana, Oklahoma, Kansas, New Mexico and Mississippi.

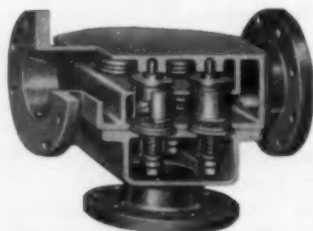
**SAVE MONEY
WITH**

Interstate

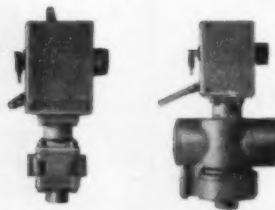
diesel service incorporated
2093 East 19th St., Cleveland 15, Ohio

America's largest GM fuel injector rebuilder

AMOT ENGINE CONTROLS



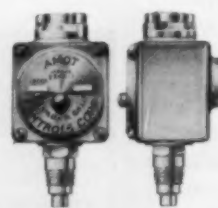
THERMOSTATIC VALVES, for jacket water and lube oil temperature control. Self contained, modulating, use no external bulbs. Sizes 1½" to 6". Temperature settings 75°F to 195°F.



MECHANICAL SAFETY CONTROL VALVES, used to shut down engines and compressors in event of oil pressure failure, overspeed, overheating of jacket water or lube oil, etc.



VENTED GAS VALVE, diaphragm operated will shut off the fuel gas and vent the manifold when used on internal combustion engine applications. Made in 2", 3" and 4" sizes.



SAFETY CONTROL SWITCH will flash warning signal, sound an alarm or close a solenoid fuel valve on overheating of jacket water or lube oil, or pressure failure of lubricating system.

AMOT CONTROLS CORPORATION • FIRST ST. & NEVIN AVE.
RICHMOND, CALIFORNIA

MODERN SLOW SPEED

DIESEL ELECTRIC GENERATOR SETS

- **600 RPM—Worthington BB5**
100kw 3/60/480
- **300 RPM—Fairbanks Morse 33F16**
1125kw 3/60/480

Complete With All Auxiliaries

Other Sets From 20kw to 1200kw

DIESEL DIVISION

National Metal & Steel Corp.
TERMINAL ISLAND (Los Angeles Harbor), CALIF.
PHONE: NEVada 6-9871

IS ACIDITY RUINING YOUR DIESELS?

MAYBE WE CAN HELP YOU.

PHONE, WIRE OR WRITE US.

INDUSTRIAL • FILTRATION SERVICE • AUTOMOTIVE

Ernest W. Dumlauer Co., Inc.

DEVELOPMENT — ENGINEERING — RESEARCH

6324 PENN AVE.

PITTSBURGH 6, PENNSYLVANIA

PHONE HIland 1-4578

AVAILABLE NOW!

1958 Diesel Engine Catalog

**New complete
information on
engines and
accessories**



look at the contents

- 1** **ENGINES**—All major manufacturers of diesel, dual fuel and gas engines are represented in multiple page sections. Text is supplemented with specifications, power curves, photographs and sectional views.
- 2** **TURBOCHARGERS and SUPERCHARGERS**—This section of manufacturers is detailed and fully illustrated to give complete information on this increasingly important phase of the industry.
- 3** **TRANSMISSIONS**—The latest information on torque converters, fluid drives, and other modern means of transmitting power are fully described and illustrated in this section.
- 4** **ACCESSORY EQUIPMENT**—Recent developments in fuel injection systems, governors, and other key accessory units are detailed and illustrated fully in this section.
- 5** **MARKET PLACE**—A convenient, time-saving listing of sources from which you can obtain the multitude of items and services needed by the fast growing Diesel Industry.
- 6** **ADVERTISING**—Leading manufacturers of engines, accessories, and services bring out the important features of their products in attractive, easy to read advertisements to further enhance the reference value of the CATALOG.

VOLUME 23 of the DIESEL ENGINE CATALOG is now available and is the biggest, most complete edition published to date. It has been completely revised and rewritten with many new or extensively changed sections graphically describing new engines and accessories. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, this new Catalog is a practical necessity. Recognized as the "Bible of the Industry," the 1958 DIESEL ENGINE CATALOG is a big 400-page book. With the same size and wide-open format as in previous editions, reference is simple and quick. Each section is fully illustrated with pictures, power curves, specification charts and sectional views. Equally important, the text presents a full description of the products and their fields of application.

READY TO MAIL NOW
order today!



This brand new edition of the 1958 DIESEL ENGINE CATALOG is now available.

Order your copy of VOLUME 23 NOW!
Still only \$10.00 per copy.

DIESEL ENGINE CATALOG

816 N. LaCienega Blvd.
Los Angeles 46, Calif.

Enter our order for _____ copy(s) of Volume 23, DIESEL ENGINE CATALOG.

Check is enclosed ☐ Bill us ☐

\$10.00 per copy (plus state sales tax when delivered in California). When ordering from Sterling Areas, remit £4:0:0 to DIESEL PROGRESS, St. Paul's Corner, Ludgate Hill, London E.C.4.

Name _____ Position _____

Company _____

Business Classification _____

Address _____

City _____ Zone _____ State _____

THOMAS

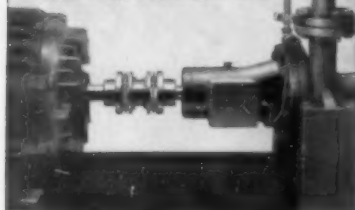
FLEXIBLE COUPLINGS

Protect your PUMPS

and other

Indispensable

MACHINERY!



NO LUBRICATION
NO MAINTENANCE
NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running. They will protect your equipment and extend the life of your machines. Properly installed and operated within rated conditions, Thomas Flexible Couplings should last a lifetime.

UNDER LOAD and MISALIGNMENT ONLY THOMAS FLEXIBLE COUPLINGS OFFER ALL THESE ADVANTAGES:

- ▶ Freedom from Backlash
- ▶ Torsional Rigidity
- ▶ Free End Float
- ▶ Smooth Continuous Drive with Constant Rotational Velocity
- ▶ Visual Inspection While in Operation
- ▶ Original Balance for Life
- ▶ No Lubrication
- ▶ No Wearing Parts
- ▶ No Maintenance

INDUSTRIAL COUPLINGS
Compressor Drives
Pump Drives

DIESEL ENGINE COUPLINGS
Main Drives
Auxiliary Drives

MARINE COUPLINGS
Main Drives
Auxiliary Drives

Write for Engineering Catalog

**THOMAS FLEXIBLE
COUPLING CO.**

WARREN, PENNSYLVANIA, U.S.A.

ADVERTISERS' INDEX

Air-Maze Corporation, The	73	Detroit Diesel Engine Div.	64-65
Alco Products, Inc.	26	Harrison Radiator Div.	2
Allis-Chalmers, Engine—Material Handling Div.	63	Harnischfeger Corp. P & H Diesel Division	8
American Bosch Division of American Bosch Arma Corp.	75	Harrison Radiator Division, General Motors Corp.	2
Amot Controls Corp.	80	Hartford Machine Screw Company	66
Bendix Aviation Corp. Scintilla Division	24	Interstate Diesel Service, Inc.	80
Bosch Corporation, Robert	11	Kent-Moore Organization, Inc.	17-18
Briggs Filtration Co., The	77	Kittell Muffler & Engineering Co.	76
C. A. V. Ltd.	59	Koppers Company, Inc.	6-7
Cities Service Oil Co.	61	Lake Shore Electric Corp.	78
Cleveland Diesel Engine Div., General Motors Corp.	71	Murray & Tregurtha, Inc.	67
Commercial Filters Corp.	10	Napier & Son, Ltd., D.	72
Cooper-Bessemer Corp.	Fourth Cover	National Metal & Steel Corp.	80
Curtiss-Wright Corp. Utica Division	13	Nordberg Manufacturing Co.	14
Dana Corporation	15	P & H Diesel Division, Harnischfeger Corp.	8
DeLaval Steam Turbine Co.	23	Purolator Products, Inc.	16
Delco Products Division, General Motors Corp.	Third Cover	Quincy Compressor Co.	70
Detroit Diesel Engine Div., General Motors Corp.	64-65	Scintilla Division, Bendix Aviation Corp.	24
Dumler Co., Ernest W.	80	Standard Oil Co. of California	21
Electric Machinery Mfg. Co.	25	Stewart & Stevenson Services, Inc.	22
Engineering Controls, Inc.	12	Texas Company, The	Second Cover-1
Enterprise Engine & Machinery Co.	19	Thomas Flexible Coupling Co.	82
Fairbanks, Morse & Co.	68	Thompson Products, Inc., Tapco Group	4
Fuller Manufacturing Co.	20	Utica Division, Curtiss-Wright Corp.	13
Garrett Corporation, The (AiResearch Industrial Div.)	9	Waukesha Motor Company	5
General Motors Corp. Cleveland Diesel Engine Div.	71	Winslow Engineering & Mfg. Co.	69
Delco Products Div.	Third Cover	Witte Engine Works, Oil Well Supply Div. of United States Steel	77
		Young Radiator Company	79



NEW

SAFE-T-GENERATOR DESIGN

New Safe-T-Generator is designed to eliminate spark producing components

Delco introduces a new Safe-T-Generator designed specifically for off-shore oil rigs, railroad refrigerator cars, shipboard uses, abrasive dust areas and troublesome weather conditions. This new generator has no commutator, slip rings or brushes to cause sparks. Instead, the conventional exciter with its DC commutator is replaced with an AC exciter employing Silicon Rectifiers. This new and improved design not only eliminates the dangers of arcing, but cuts maintenance problems to a minimum.

The Safe-T-Generator offers the same rugged dependability for which Delco's standard conventional generators have long been noted. Get all facts—get in touch with your local Delco Products Representative and find out how this new, safer generator can mean longer trouble-free life in your operation.



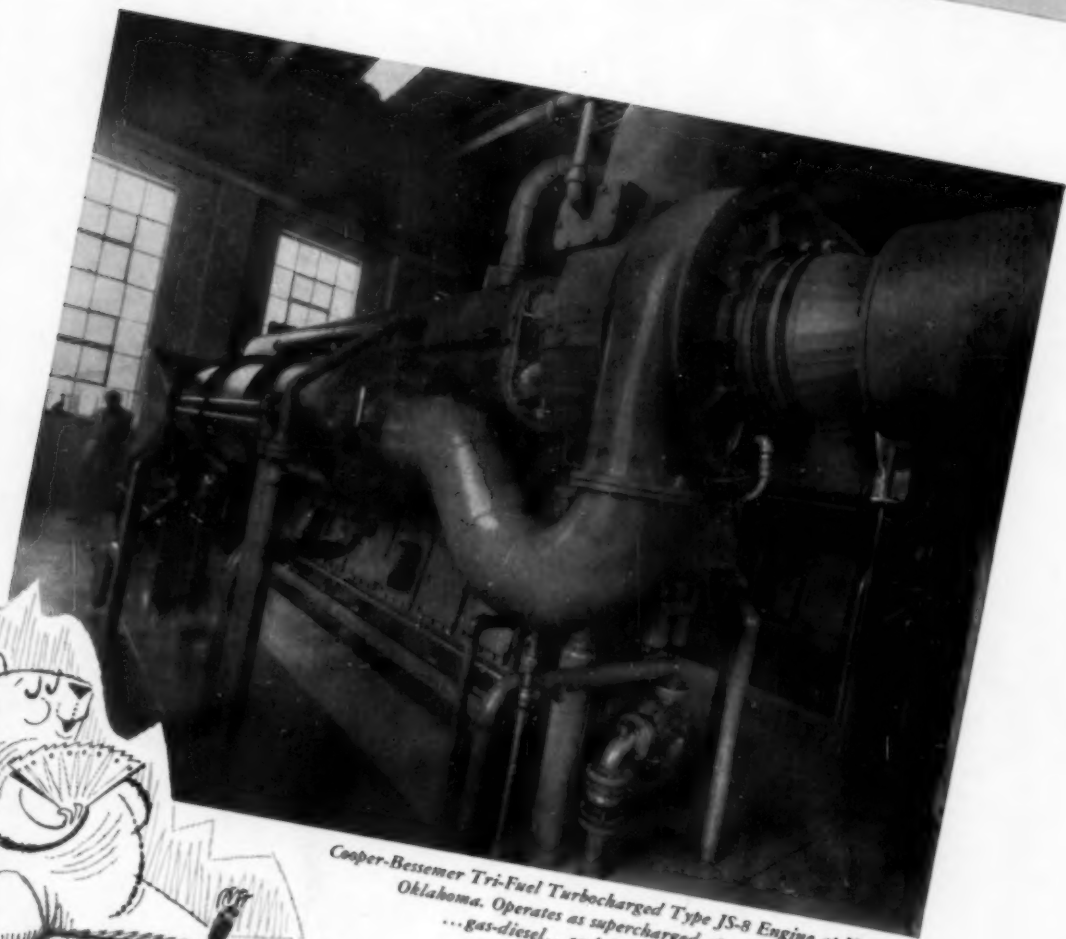
*Wherever power is required
from 10 kw to 300 kw,
there is a Delco generator
to meet the need.*



**DELCO
MOTORS**

Delco Products, Division of General Motors, Dayton, Ohio

- APPLIANCE MOTORS • INDUSTRIAL MOTORS
- GENERATORS • ACTUATORS
- AUTOMOTIVE AND HYDRAULIC EQUIPMENT
- HERMETIC MOTORS AND CONTROLS
- RESIDENTIAL GARAGE DOOR OPERATORS
- AIR SUSPENSION COMPONENTS



Cooper-Bessemer Tri-Fuel Turbocharged Type JS-8 Engine at Hominy, Oklahoma. Operates as supercharged, spark-ignited gas engine ...gas-diesel...or full diesel. Rated 1425 hp at 450 rpm.

chills its combustion air... shrinks engine fuel costs

The City of Hominy, Oklahoma, is piling up cool savings by boosting fuel efficiency with the Cooper-Bessemer 1425 hp engine shown above. Equipped with a combustion air cooling system, to pack more air... more oxygen... into the engine, this JS8 engine is setting an exceptional record of fuel economy of 6200 Btu/bhp/hr.

When planning expansion for its power plant, it is understandable why Hominy turned to Cooper-Bessemer for dependable, low-cost performance. A previous JS engine of 986 hp rating ran 60,000 trouble-free hours before its first overhaul.

To make sure that you get the latest power advancements for your expansion or modernization, consult Cooper-Bessemer when you start to plan. Contact the nearest office for complete information.

BRANCH OFFICES: Grove City • New York • Chicago • Washington • San Francisco • Los Angeles • Houston • Dallas • Odessa • Tampa • Greggton • Seattle • Tulsa • St. Louis • Kansas City • Minneapolis • New Orleans • Shreveport.

SUBSIDIARIES: Cooper-Bessemer of Canada, Ltd. • Edmonton • Calgary • Toronto • Halifax • Cooper-Bessemer International Corporation • New York • Caracas • Mexico City.

Cooper-Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

ENGINES: GAS • DIESEL • GAS-DIESEL
COMPRESSORS: RECIPROCATING AND CENTRIFUGAL
ENGINE OR MOTOR DRIVEN